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AFFILIATED WITH
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LIBRARY NOTES

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Books and Pamphlets Added to the Library During June

BOTANY—HISTORY

REED, HOWARD S. A short history of the plant sciences. Waltham, Mass., Chronica Botanica Company, 1942. 323 p.

CHEMICAL REACTIONS

FRIESS, S. L., and WEISSBERGER, A., ed. Investigations of rates and mechanisms of reactions. Technique of organic chemistry. v. 8. New York, Interscience Publishers, 1953. 760 p.

CHEMISTRY, ORGANIC

ORGANIC REACTIONS. Roger Adams, editor-in-chief. New York, Wiley [c1953] v. 7. 440 p.

ENGINEERING—BIBLIOGRAPHY

The ENGINEERING INDEX, 1952. New York, Engineering Index, Inc. [c1953] 1219 p.

FIBERS

HAARER, A. E. Jute substitute fibres, Bimli-jute, the roselle and Aramina fibre. [Dorchester] Wheatland Journals Ltd. [1952] 185 p.

FURAN

DUNLOP, A. P., and PETERS, F. N. The furans. New York, Reinhold, 1953. 867 p.

ION EXCHANGE

AMERICAN SOCIETY FOR TESTING MATERIALS. Symposium on exchange phenomena in soils. Presented at the 55th annual meeting (50th anniversary meeting) American Society for Testing Materials, New York, N.Y., June 27, 1952. ASTM special publication no. 142. Philadelphia, The Society [c1953] 74 p.

MINES AND MINERAL RESOURCES

U. S. BUREAU OF MINES. Minerals yearbook, 1950. Leonard L. Fischman, editor; assisted by John Hozik [and] Robert E. Herman. [Washington, U. S. Govt. Print. Off., 1953] 1690 p.

PAPER—TESTING

HERZBERG, WILHELM. Papierprüfung, eine Anleitung zum Un-

tersuchen von Papier. 4. vermehrte und verbesserte Auflage. Berlin, Springer, 1915. 276 p. + 23 plates.

PAPER MAKING AND TRADE

JOINT EXECUTIVE COMMITTEE ON VOCATIONAL EDUCATION REPRESENTING THE PULP AND PAPER INDUSTRY OF THE UNITED STATES AND CANADA. Pulp and paper manufacture. v. 3. Manufacturing & testing of paper and board. J. Newell Stephenson, editor-in-chief. New York, McGraw-Hill Book Co., 1953. 945 p.

PAPIERMACHER Taschenbuch. Heidelberg, Hubertus Verlagsgesellschaft [c1952] 254 p.

RAW MATERIALS

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. Raw materials for more paper; pulping processes and procedures recommended for testing. Findings of an FAO pulp and paper consultation, Rome, Italy, December 1952. FAO forestry and forest products study no. 6. Rome, Italy, The Organization, 1953. 171 p.

TESTING

AMERICAN SOCIETY FOR TESTING MATERIALS. 1952 Book of A.S.T.M. standards including tentatives (a triennnial publication). Philadelphia, The Society [c1953] 7 v. Part 1, Ferrous metals. 1572 p.; Part 2, Non-ferrous metals. 1327 p.; Part 3, Cement, concrete, ceramics, thermal insulation, road materials, waterproofing, soils. 1634 p.; Part 4, Paint, naval stores, wood, fire tests, sandwich constructions, building constructions. 1152 p.; Part 5, Fuels, petroleum, aromatic hydrocarbons, engine antifreezes. 1253 p.; Part 6, Rubber, plastics, electrical insulation. 1488 p.; Part 7, Textiles, soap, water, paper, adhesives, shipping containers. 1334 p.

UNIVERSITIES AND COLLEGES

INDEX GENERALIS; general yearbook of universities and of higher educational institutions—academies—archives—libraries—scientific institutes—botanical and zoological gardens—museums—observatories—learned societies, directed by S. de Montessus de Ballore. 19th year, 1952-1953. Paris, Dunod, 1953. 1673 + 55 p.

WATER

VOM WASSER. Ein Jahrbuch für Wasserchemie und Wasserreinigungstechnik. Herausgegeben von der Fachgruppe Wasserchemie in der Gesellschaft Deutscher Chemiker. Verantwortlich für den Text: Wilhelm Husmann. Weinheim, Verlag Chemie [c1953] 19. Band 1952. 416 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

STANDING, H. A., and STEIN, M. The absorption spectra of the direct dye Benzopurpurine 4B and related structures. J. Textile Inst. 44, no. 5: T224-9 (May, 1953).

The absorption spectrum of the dis-azo dye Benzopurpurine 4B, derived from *o*-tolidine, is very different from that of the corresponding mono-azo half structure, similarly derived from *o*-toluidine, whereas the spectrum of the isomeric dis-azo compound derived from *m*-tolidine is similar to that of the corresponding half structure; the spectra of the two half structures are almost identical. The difference between the spectra of the two dis-azo compounds is attributed to steric hindrance to planarity in the molecules of the *meta* isomer, which other workers have shown to be the cause of the difference in their affinity for cellulose. 4 diagrams and 7 references. E.S.

ACID PLANT

ANON. Wausau's new acid plant in full operation. Paper Trade J. 136, no. 23: 10 (June 5, 1953); Paper Mill News 76, no. 23: 6 (June 6, 1953).

The new plant is specifically designed for the preparation of ammonia-base sulfite acid. The special tower consists of a 48-foot, tile-lined steel cylinder, six feet in diameter, and encases layers of glazed spiral rings. Fifty-four thousand small mixing units, stacked end on end, form a filter bed, where sulfur dioxide gas and aqua ammonia merge with water-shower sprays to form cooking acid. Automatic controls, gages, and recorders check practically every phase of operation. 3 illustrations in the first and 4 in the second reference. E.S.

AERONAUTICS IN FORESTRY

CLASON, MICHAEL. Aerial photography in American forestry. Norsk Skogind. 7, no. 5: 152-61 (May, 1953). [In Norwegian; English summary]

The author describes the U. S. Forest Service and its departments, and the organization and administration of this body. The important part played by aerial photography in taking forest inventories is emphasized, and the procedures involved are discussed in detail; their application to Norwegian forestry is recommended. 2 tables and 13 figures. E.S.

ASSOCIATIONS

BATES, JOHN S. The forces of technical progress. Pulp Paper Mag. Can. 54, no. 6: 170-2 (May, 1953).

The founding of the Technical Section of the Canadian Pulp and Paper Association and important events in its history, notably the establishment of the Pulp and Paper Research Institute of Canada in Montreal, are described.

A list of the charter members is included. 1 table and 2 illustrations. R.A.S.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section.* Technical section activity. Pulp Paper Mag. Can. 54, no. 6: 193-7 (May, 1953); *cf.* B.I.P.C. 22: 808.

At a joint meeting of the Executive Council and chairmen of divisions and committees held on March 24, 1953, the latter outlined the work done during the past year and plans for work to be done in the current year. R.A.S.

CRABTREE, HAROLD, ROBINSON, F. G., and FOWLER, R. M. Presidential parade. Pulp Paper Mag. Can. 54, no. 6: 148-54 (May, 1953).

Two former presidents and the present permanent president of the Canadian Pulp and Paper Association give historical and statistical information under the following headings: Crabtree, Harold. From the turn of the century, p. 148-50; Robinson, F. G. The C.P.P.A. goes to war, p. 150-3; and Fowler, R. M. The C.P.P.A. in the post war era, p. 153-4. 22 portraits of executives. R.A.S.

MACDONALD, R. G. Personal development through local section activity. Tappi 36, no. 6: 147-50A (June, 1953).

In a discussion of the activities of TAPPI and its local sections presented to the senior pulp and paper students on the College of Forestry Senior Night of the Empire State Central District, the author outlines the development, growth, and possibilities for participation in the activities of the organization and emphasizes the benefits which both the Association and its members derive from their mutual relationship and contact. E.S.

BARKERS AND BARKING

ANON. How wood is handled and barked by Keyes Fibre Co. Paper Trade J. 136, no. 21: 14-16 (May 22, 1953).

The Shawmut, Maine groundwood mill of Keyes Fibre Co. founded in 1920 was originally supplied with sap-peeled pulpwood bought from contractors; this is no longer readily available in the Northeast, and prospects for improvements are uncertain. Hence, a system to handle rough wood had to be developed. The installation and operation of an Allis-Chalmers Streambarker and a Link-Belt crane and Wellman grapple for withdrawing the rough wood from the piles and supplying the barker are described. Burning of the bark is not possible but an ample bark-piling area is available adjacent to the barking room. Originally the barker operated only during the warm season and a stockpile of streambarked wood sufficient for use during the winter months was accumulated. However, serious wood degradation, particularly red stain in balsam, caused considerable losses. A hot pond will therefore be installed during the summer, which will make it possible to operate the barker on a 12-month basis eight hours a day, with a small reserve pile of sap-peeled wood (which does not rot readily) in case trouble requires the shutdown of the barker. 3 figures. E.S.

ANON. New barking equipment and methods permit utilization of sawmill waste. Paper Ind. 35, no. 2: 181-3 (May, 1953).

The two types of Andersson barkers (*cf.* B.I.P.C. 23: 471), the Carpenter barker (*cf.* B.I.P.C. 23: 390), the Bauer aspiration barker (*cf.* B.I.P.C. 23:

310-11), slab-barker types on the market and in the process of construction, and chemical debarking, and the possibilities of these developments are discussed. 3 tables and 6 figures. E.S.

HOLM, BÖRJE. Barking drums. Svensk Papperstidn. 56, no. 10: 374-7 (May 31, 1953). [In Swedish]

The construction, mode of operation, and advantages of the Waplan floating barking drum are described. 14 figures. E.S.

BLACK LIQUOR

HARVIN, R. L., and BROWN, WILSON F. Specific heat of sulphate black liquor. Tappi 36, no. 6: 270-4 (June, 1953).

The specific heat of sulfate black liquor was measured over the range of concentration from 4.9 to 52.6% solids and temperature from 100 to 200°F. The data were correlated on a graph of specific heat *vs.* solids concentration with temperature as a parameter. An empirical equation was developed relating the three variables and was used to extrapolate the data to higher concentrations and to temperatures beyond those obtainable in the apparatus at atmospheric pressure. Using the concentration-temperature data from a typical black-liquor evaporator, a simplified empirical relation was found which gives values of specific heat as a function of concentration only, wherein the effect of temperature was included in the value of the constants. 2 tables, 4 figures, and 5 references. E.S.

BLEACHING

CARR, R. L., and MACLEOD, K. S. Pulp bleaching with sodium chlorite. Tappi 36, no. 5: 195-8A (May, 1953).

The authors review the application of sodium chlorite (C2, the trade name of the commercial sodium chlorite product available to the pulp and paper industry) and chlorine dioxide to flax, rag, and kraft pulps, and to acid bleaching. Whatever the ultimate use of these pulps, the basis for employing C2 bleaching is common to all—i.e., maximum brightness consistent with high strength retention. Chlorine dioxide in acid solution is highly corrosive to normal mill equipment; this forms the principal practical limitation to the use of acid chlorite in many mills. However, in bleaching on the alkaline side, not much additional equipment beyond the existing bleach-plant facilities is required as a rule. In conclusion, various processes for generating chlorine dioxide are reviewed briefly. In the selection of such a process the type and quantity of pulp to be bleached, the use of continuous or intermittent production, the amount of chlorine dioxide to be applied, and the desirability of capital outlay must receive consideration. 6 references. E.S.

BLEACHING—SULFATE

CHANNON, H. B. Values of acidic reducing agents in kraft bleaching. Tappi 36, no. 5: 198-200A (May, 1953).

A progress report of field work on the removal of color bodies in kraft bleaching is presented. The author emphasizes that a point is reached in kraft bleaching where it is inadvisable to continue with the oxidation stages, because a more complete destruction of the cellulose takes place with losses which are not economically justifiable. At this stage the use of a reducing agent is recommended; sulfur dioxide, for instance, effectively stops further deterioration of the cellulose from oxidation and converts the color bodies to colorless and soluble compounds. The previous use of sodium bisulfite and

sulfuric acid for the same purpose and the superiority of sulfur dioxide are discussed. If a proper reaction time is allowed, a high degree of color stability develops. The flash bleaching or increase in G.E. brightness which results when the sulfur dioxide is properly handled can be attributed to one of three possible reactions with the color bodies present. It has not yet been determined which one of these reactions is the responsible one, as the research work has not yet been completed. Further findings of interest will be published at a later date. 2 tables, 4 figures, and 4 patent references. E.S.

BOARD

GOODFELLOW, GEORGE D. Plaswood, new high-density-chipboard. J. Forest Products Research Soc. 3, no. 2: 76, 90-1 (June, 1953); *cf.* B.I.P.C. 23: 475.

The development, manufacture, applications, and limitations of a new high-density chipboard and potential improvements are described. In addition to making possible a new product of many uses, the process greatly broadens the utilization of the total content of the tree. 2 illustrations. R.A.S.

BOARD MILLS

DOWNINGTOWN MANUFACTURING COMPANY, *Downingtown, Pa.* Newest paperboard mill on Pacific Coast. Paper Trade J. 136, no. 22: 14-17 (May 29, 1953); Paper Mill News 76, no. 21: 14-18 (May 23, 1953).

The new Flintkote mill recently completed at San Leandro, Calif. consists of a 100-ton-per-day paperboard mill and box plant for the manufacture of corrugated shipping containers. The stock-preparation system for the top liner, filler, and bottom liner supply consists of two Downingtown Fibre-pulpers, one continuous type for the filler stock and one batch type for the top- and bottom-liner stocks. The former is equipped with junk removers, rag catchers, and extraction chambers. The board machine consists of six Downingtown Conflow vats and 66 driers, and is driven by Downingtown spiral bevel-gear floor drives. The container plant, actually in operation since September, 1952, houses an 80-inch S&S corrugating unit, printer-slotters, stitchers, and tapers. The containers made from Weatherkote board are specially suited to high-moisture atmospheric conditions and rough handling and are used for the shipment of perishable produce, such as berries, lettuce, tomatoes, grapes, and eggs, particularly in the northern and central California areas. Although the two articles give essentially the same information, they are not identical. 8 illustrations in the first and 12 in the second reference. E.S.

BOARD SPECIALTIES

ANON. Circular carrier. Modern Packaging 26, no. 10: 110-11 (June, 1953).

Circular paperboard tumbler carriers, which can be shipped flat and easily assembled, are being used by Boonton Molding Co., which finds them superior to present types. The carriers can be securely stacked by the handle fitting in the slot in the bottom of the carrier above, and the merchandise is shown to better advantage. 3 illustrations. R.A.S.

BOARD TESTING—PHYSICAL

BRYNHILDSEN, HANS OLAV, OLSSON, INGEMAR, and PIHL,

LENNART. Studies on the creasing of board. Svensk Papperstidn. 56, no. 9: 328-37 (May 15, 1953). [In Swedish; English and German summaries]

Following a survey of earlier investigations dealing with the creasing of board, the experimental work at the Graphic Arts Research Laboratory in Sweden is described. The creasing properties of board are defined, and the variables which may exert an influence on the creasing process are discussed theoretically. A new method for the dynamic measurement of the compressibility of paper and board developed at the laboratory is outlined. The viscoelastic properties of board in connection with their compressibility are considered the primary factors; experiments support this hypothesis. The results indicate that the creasing of board depends upon the following factors: strain, compressibility of the middle ply, humidity, and general strength properties. An instrument for making creasing tests (GFL creasing tester, developed at the laboratory) and its mode of operation are described. The experimental work with this tester was evaluated with the aid of analysis of variance. 3 tables, 17 figures, and 11 references. E.S.

STILLINGER, J. R. Effect of head speed and span on modulus of rupture in several types of commercial hardboards. J. Forest Products Research Soc. 3, no. 2: 70-5, 90 (June, 1953).

Thirteen types of hardboard representing four producers, four sources of raw material, three basically different processes, two thicknesses, and two classes (treated and untreated) were included in the sampling plan to investigate the relationship of head speed, span, and modulus of rupture in the testing of commercial hardboards. Eight head speeds ranging from 0.05 to 4 in./minute were employed in testing material over 4- and 8-inch spans. As a check on previous work, a supplementary experiment included testing one type of board on the 2-, 3-, and 6-inch spans for part of the range of head speeds. The analysis of test data showed that for each type of board tested there was a range of head speeds from 0.5 to 2 in./minute that did not yield significantly different modulus-of-rupture values. The test results further indicated that there was a rate of fiber strain which was critical, although not accurately determined and which, when reached, produced very definite decreases in modulus-of-rupture values. The test results clearly suggest the advisability of changing the static bending procedure in the current tentative A.S.T.M. Standard D 1037-52T "Evaluating the properties of fiber building boards" to recommend the use of a 6-inch span and any head speed between 0.5 and 2 in./minute for all commercial hardboards regardless of thickness or class of board. 6 tables, 5 figures, and 6 references. E.S.

CELLOPHANE

ANON. Cellophane for dry edibles. Modern Packaging 26, no. 10: 151-5, 220, 222 (June, 1953).

A research program to find the most practical and durable packaging material for dry edible beans and similar commodities involved studies in the use of cellophane under different climatic conditions. Various types of cellophane and packages now in use were compared on the basis of film durability and shrinkage, weight and loss of product, printing on film, exposure to high or low humidity, use with high-moisture content beans, appearance of packages, sealing of bags, and susceptibility to insect penetration. Cellophane was found more satisfactory for 1-, 2-, and 3-lb. containers than the use of other transparent films, such as saran, Pliofilm, polyethylene, and others; the latter, however, although more expensive, are recommended for the packaging of

larger amounts where cellophane proved liable to break, even in the heavier weights. 7 figures. R.A.S.

CELLULOSE

ROSCHIER, R. H., HYVÄRINEN, SIMO, and AHOLA, ANNELI. On hydroxoanionic compounds of cellulose. II. Paper and Timber (Finland) 35, no. 4: 181-5 (April, 1953). [In English] *cf.* B.I.P.C. 23: 476.

In addition to the previously known hydrated cuprite anion, the authors found that the corresponding hydrated plumbite and antimonite anions combine with cellulose, whereas other anions related to these (such as the hydrated stannate, stannite, aluminate, chromate, and arsenite anions) do not combine with it. One glucose anhydride mole binds one plumbite mole; the bonds are probably weak hydrogen bridges which are easily ruptured by washing with water. The combination of plumbite takes place in accordance with the law of mass action and at the same time follows Langmuir's isotherm. Many of the hydrated anions which precipitate gum arabic solution also combine with cellulose. Plumbite precipitates cellobiose; both plumbite and antimonite precipitate α- and γ-cellulose. The hydrated zincate anion dissolves depolymerized cellulose, whereas the solubility of native cellulose is very slight. It seems very probable that the prerequisite for the formation of a cellulose compound is a particular spatial configuration of the hydrated anion; planar configuration in particular has proved to be beneficial. 5 tables, 4 diagrams, and 6 references. E.S.

CELLULOSE—CRYSTALLINITY

NELSON, MARY L., and TRIPP, VERNE W. Determination of the leveling-off degree of polymerization of cotton and rayon. J. Polymer Sci. 10, no. 6: 577-86 (June, 1953). [French and German summaries]

The effects of variations in hydrolytic conditions upon change in estimated D.P. of cotton linters and viscose rayon have been explored by varying the acid concentration downward over the range of 2.5 to 0.01 *N* and by carrying out the hydrolysis at 100 and 80°C. It was observed that temperature and acid concentration do not affect appreciably the value obtained for the leveling-off D.P. (I), although they do affect the rate of hydrolysis. An alternative way of determining (I) has been devised; (I) is that value on the curve of D.P. *vs.* residue percentage, under conditions of continuous hydrolysis, at which the slope of the tangent to the curve first attains a minimum absolute value. The moisture regain data on the hydrocelluloses indicate that cotton linters may recrystallize to a slight extent, whereas rayon does so in significantly greater amount. This crystallization may take place either in the aqueous hydrolytic medium or during the drying of the hydrocellulose; the relative amount occurring at either stage is unknown. 6 graphs and 21 references. E.S.

SEGAL, LEON, NELSON, MARY L., and CONRAD, CARL M. Further studies on cotton cellulose with reduced crystallinity. Textile Research J. 23, no. 6: 428-35 (June, 1953); *cf.* B.I.P.C. 21: 538-9.

Further studies have been made of the variables in the application of anhydrous ethylamine to cotton cellulose. The crystallinity of the product has been estimated by means of the acid-hydrolysis residue method. An indication of crystallite length has been obtained by the use of the "leveling-off" D.P.

The reduction of crystallinity has been shown to take place rapidly and to be independent of the D.P. of the cellulose. The maximum reduction in crystallinity was found to occur in material that was free of tension. Crystallite orientation was essentially unaffected by the treatment. The cellulose II pattern was always found in the cellulose after contact with mercerizing caustic, regardless of the sequence of treatment. A crystallite length of 150 anhydroglucose units seems to be a more stable structure after amine treatment than that of 225 units, which is usually found in native cotton. 6 tables, 3 figures, and 20 references. E.S.

CELLULOSE—DEGRADATION

SCHWENKER, R. F., JR., and WHITWELL, J. C. Effects of ultrasonic radiation on the viscosity of cellulose solutions. Textile Research J. 23, no. 6: 436-7 (June, 1953).

The authors experimented to find the effect of degradation caused by ultrasonic waves by dissolving samples of cotton and rayon in 0.5 *M* cupriethylenediamine. The solutions were protected from oxidative degradation by purified nitrogen. Portions of each solution were then exposed to ultrasonic radiation and viscosity measurements used to estimate the effect. The authors conclude that the viscosity decrease in this instance is primarily associated with the rupture of valence bonds. 10 references. R.A.S.

CELLULOSE—DERIVATIVES

GIBBONS, G. C. The moisture regain of methylcellulose and cellulose acetate. J. Textile Inst. 44, no. 5: T201-8 (May, 1953).

Measurements have been made of the moisture regains, at 65% and 80 or 85% R.H., of homogeneously substituted methylcelluloses and cellulose acetates of various degrees of substitution (D.S.). The moisture regain, expressed as molecules of water/glucose residue, was found to increase initially and then decrease linearly with increasing D.S. It is considered that the linear relation shows the effect of substitution on the hygroscopicity of fully accessible cellulose and that on extrapolation to zero D.S. the intercept represents the proportion of water in fully accessible unsubstituted cellulose. Thus, fully accessible cellulose contains 1.53, 1.91, and 2.29 molecules of water/glucose unit at 65, 80, and 85% R.H., respectively. For any specimen of cellulose the ratio of observed moisture regain to regain of fully accessible cellulose at the same R.H. gives the proportion of its hydroxyl groups that are accessible to moisture. The values for bleached cotton, mercerized cotton, and viscose rayon are about 0.4, 0.5, and 0.8, respectively. 4 tables, 1 diagram, and 16 references. E.S.

CELLULOSE—HEMICELLULOSE

ASPINALL, G. O., HIRST, E. L., MOODY, R. W., and PERCIVAL, E. G. V. The hemicelluloses of esparto grass (*Stipa tenacissima*, L.). The arabinose-rich fraction. J. Chem. Soc.: 1631-4 (May, 1953).

An arabinose-rich fraction has been isolated from esparto-grass hemicellulose. This gave on hydrolysis D-xylose (12 parts), L-arabinose (5 parts), D-glucose (1 part), and D-galactose (1 part). Hydrolysis of the methylated polysaccharide gave 2,3,5-trimethyl-L-arabinose (1 part), 2,3-dimethyl-D-xylose (3 parts), and 2-methyl-D-xylose (1 part), together with smaller quantities of 2,3-dimethyl-L-arabinose, 2,3,4,6-tetramethyl-D-galactose, 2,4,6-trimethyl-D-galactose, and 2,4-dimethyl-D-galactose. It is concluded that the

majority of the L-arabofuranose residues are present as side chains attached to a main chain of 1,4-linked D-xylopyranose residues. 2 tables. E.S.

CELLULOSE—OXYCELLULOSE

BATTENBERG, ERNST, and BERG, ALEX. Contributions to the structure of oxidized celluloses. Chem. Ber. 86, no. 5: 640-5 (May 30, 1953). [In German]

The action of nitrogen dioxide on cellulose is known to consist primarily of oxidation at position 6 to a carboxyl group, but to a lesser extent also at positions 2 and 3 to ketone groups. The present work indicates that in some cases all three types of oxidation may occur on the same glucose unit. By hydrolysis of nitrogen dioxide-oxidized cellulose they have isolated in 3% yield a triketopyrane which they believe to be 3,5-dioxotetrahydro-γ-pyrone, produced by dehydration and decarboxylation of 2,3-diketohexuronic acid. 1 figure and 8 references. K.W.,Jr.

HEAD, FRANK S. H. The effect of daylight on the periodate oxidation of β-methyl glucose, β-methyl cellobioside, and cellulose. J. Textile Inst. 44, no. 5: T209-23 (May, 1953).

Light accelerates the periodate oxidation of β-methyl glucoside, β-methyl cellobioside, and cellulose. It is doubtful whether the initial (Malaprade) stage of the oxidation (*cf.* B.I.P.C. 8: 117) is affected, but the rates of the subsequent "overoxidation" reactions are greatly increased. In the dark the oxidation becomes very slow at the end of the Malaprade stage, but in daylight there is no detectable discontinuity in the rate curves at this point. Overoxidation proceeds slowly even in the dark, however, and ultimately the same results are obtained as in the light-accelerated reactions. When sufficient periodate is used, the oxidation continues until the organic matter has been oxidized to carbon dioxide and water; with insufficient oxidant, complete reduction of periodate to iodate occurs, followed by reduction of iodate and liberation of iodine. With a moderate excess of periodate over the amount required for the Malaprade reaction, cotton cellulose suffers a progressive loss of weight when oxidized in daylight, but in the dark the loss does not become considerable until the Malaprade stage is passed. Oxidation beyond this stage leads to the formation of an increasing proportion of soluble products, and ultimately a homogeneous nonviscous solution is obtained. Formaldehyde and formic acid are formed in greater proportions than would be expected from oxidation of the terminal glucose units. The yield of acid is higher in the light than in the dark. For a given degree of oxidation, periodate oxycelluloses prepared in daylight have lower copper numbers than those made in the dark. These results suggests that, for a given set of conditions and a fixed degree of oxidation, the ratio of Malaprade to other kinds of oxidation is higher in the dark than in daylight. The mechanism of the overoxidation of cellulose is discussed. 2 tables, 7 diagrams, and 21 references. E.S.

CELLULOSE—REACTIVITY

BRICKMAN, W. JAMES, DUNFORD, H. BRIAN, TORY, ELMER M., MORRISON, JOHN L., and BROWN, ROBERT K. The reactivity of cellulose. II. Water sorption, heats of wetting, and the reactions with thallous ethylate in ether, nitration mixtures, and heavy water of cotton linters alternately wetted with water and dried. Can. J. Chem. 31, no. 6: 550-63 (June, 1953); *cf.* B.I.P.C. 20: 781.

Cotton linters dewaxed with benzene and alcohol possess a slightly expanded structure attributed to the swelling effect of the alcohol. Storage causes a partial collapse of the linters, especially when moisture is present. Wetting with water followed by rigorous drying produces a marked reduction in accessibility, but with each additional wetting-drying cycle accessibility of the dried linters increases slightly as measured by reaction with thallous ethylate in ether, a nitration mixture, and in hydrogen-deuterium exchange. Differences in nitration found for limited reaction times are obliterated when these reaction times are extended. Increasing accessibility caused by repeated wetting and drying is accompanied by lower water sorption and smaller heats of wetting. This anomaly is due to the fact that cellulose samples obtained by alternately wetting and drying dewaxed linters, when stored with a desiccant, compete for the limited amount of water present and adsorb moisture in proportion to their accessibility. Upon further exposure to water the sample of least accessibility, having adsorbed less water, can now adsorb to a greater extent than do the linters of somewhat greater accessibility. The evidence indicates that the difference in accessibility occasioned by repeated wetting and drying is of a physical rather than chemical nature. 7 tables, 7 graphs, and 31 references. E.S.

MELLER, ALEXANDER. Studies on modified cellulose. III. Characterization of the reactivity and supermolecular structure of cellulose fibers. Tappi 36, no. 6: 264-8 (June, 1953); *cf.* B.I.P.C. 22: 484.

A mathematical expression has been derived by which the constants of the rates governing the reactions with the difficultly and a portion of the easily reacting fractions of cellulose fibers can be characterized. Knowing these constants, the relative amounts of the easily and the difficultly reacting fractions can also be assessed. The usefulness of the equation derived has been demonstrated by applying it to experimental results obtained by acid hydrolysis of different wood pulps and tire-cord rayon, as well as by conversion of ammonia cellulose by metallic sodium. The need for a full characterization of both the easily and difficultly reacting fractions of cellulose fibers is stressed, as discussed previously. This full characterization concerns a portion of the easily reacting fraction which seems to react according to a mechanism controlled by a diffusion process in the solid structure of the fibers. Evaluation of data taken from a recent publication on the removal of lignosulfonic acid by water (*cf.* B.I.P.C. 22: 498-9) lends further support to this view. 4 tables and 20 references. E.S.

CELLULOSE ESTERS

BORGIN, KARL. A new method for studying the solubility properties of cellulose acetates. Tappi 36, no. 6: 284-8 (June, 1953); *cf.* B.I.P.C. 23: 398-9.

The solubility properties of a cellulose manifest themselves in the variation of viscosity, viscosity anomalies, gel-structures, microgels, and molecular aggregates. It could be shown that there was a close connection between many of these properties and the ability of cellulose acetate to spread to monomolecular layers on a water surface. The spreading of cellulose acetate to monomolecular layers under suitable experimental conditions also gives an indication of the type of cross links and chemical bonds that are responsible for the formation of microgels and molecular aggregates in solution. The effect of hydrogen bonds and other cross links on these structures was studied. It could be shown that cellulose acetates made from different commercial

celluloses contained two types of cross links, formed by bivalent ions or hydrogen bonds. Cellulose pulps refined by the cold alkali or the combined cold-hot alkali processes contained a great number of resistant cross links which caused poor solubility properties of the corresponding acetates. It is believed that highly reactive celluloses, from which cellulose acetates with good solubility can be made, can be manufactured only by hot alkali treatment in connection with multistage bleaching. 3 tables, 8 figures, and 11 references. E.S.

NICOLAYSEN, V. B., and BORGIN, KARL. The importance of lignin, carbohydrates and resins for the discoloration of cellulose acetate. Norsk Skogind. 7, no. 5: 134-42 (May, 1953). [In English; Norwegian summary]

The authors studied the causes of the discoloration of cellulose acetate and found that the yellow or brown color is caused by the presence of three principal agents: lignin; decomposition products of cellulose, hemicellulose, and other carbohydrates; and resin or resinous products. A close relationship between the lignin content in the cellulose and the color of cellulose acetate was established. Celluloses with a high lignin content were acetylated, and the typical absorption spectrum of lignin was found in the cellulose acetate dissolved in chloroform. The absorption at 280 mμ was almost proportional to the lignin content of the original cellulose. On the other hand, the selective absorption of lignin could not be found in commercial grades of cellulose acetate. However, their yellow color might still be caused by lignin, in that the colored material may be derived from lignin condensation products of a colloidal nature. The lignin derivatives of relatively simple structure are removed from the cellulose during the alkaline bleach, whereas the colored condensation products, on account of their colloidal nature, remain in the cellulose. The condensation products have a very strong light absorption in the ultraviolet range which continues into the blue range of the visible spectrum. Hence, some kind of selective absorption takes place in the visible spectrum, with the result that the cellulose acetate looks yellow to the human eye. Colored or colorless decomposition products may be formed when cellulose, hemicelluloses, or other carbohydrates are treated with chemicals, especially at high temperatures; drying of the cellulose at high temperatures may have the same effect. The nature and exact composition of these products are not known, but in many cases they consist of compounds derived from furfural and 5-(hydroxymethyl)-furfural. They are often water soluble, and the principal portion is without effect on the color of cellulose acetate. However, a smaller fraction is insoluble and consists of high-molecular condensation products derived from the decomposition products of hemicelluloses and other carbohydrates. They cannot be readily removed from the cellulose or cellulose acetate and are yellow to brown in color. They do not possess any characteristic absorption spectra, but a strong absorption in the ultraviolet which continues into the blue range of the visible spectrum. Resin and resinous products are not removed during the acetylation of cellulose. The yellow color of the acetate caused by resins is, therefore, proportional to the resin content in the original cellulose. If resin is present in greater quantities, characteristic absorption spectra may be found in the chloroform solutions of the acetate. Such spectra were never found in commercial cellulose acetates. When cellulose was fractionated according to fiber lengths, the authors found that the color caused by resin always originated in the shortest fiber fraction. Acetates prepared from celluloses from which the fines had been removed were almost colorless. 11 figures and 19 references. E.S.

CHEMICAL TESTING—BLACK LIQUOR

BORLEW, PETER B., and LANCASTER, S. JEROME. Rapid and

accurate determination of black liquor solids by infrared drying. Southern Pulp Paper Mfr. 16, no. 6: 44, 46, 48 (June, 1953).

A rapid and accurate method for determining the sum of water and other volatile constituents of black liquor is not available. The principal disadvantage of generally used methods is their time-consuming feature, which may range from 48 to 72 hours if accurate results are desired. An infrared drying technique was developed, using a torsion balance which reads directly the percentage of volatile matter with a sensitivity of 0.1% for determining the solid contents of residual pulping liquors, including those in the high range of sulfate black liquors; the procedure and necessary precautions are outlined. Data on the behavior of kraft black liquor toward infrared radiation and the adoption of a standard 125-watt lamp at 120 volts are included. The results of analyses comparing the infrared, xylene-distillation, and oven-drying methods are presented; however, the degree of accuracy of any of these three methods can be determined only when a sufficient amount of comparative data for a statistical evaluation becomes available. The present results indicate that the infrared method for determining solid contents can be applied in a universal manner for the rapid control of operations, as well as for accurate research purposes. It can also be used for the rapid indirect evaluation of soda in kraft black liquors. 1 table and 14 references. E.S.

CHEMICAL TESTING—CELLULOSE ETHERS

FRANCIS, C. V. Sodium carboxymethylcellulose. Anal. Chem. 25, no. 6: 941-3 (June, 1953).

The use of available methods of analysis for sodium carboxymethylcellulose for active-agent content and degree of substitution (D.S.) has shown that no single method can be universally applied to all commercially available materials; an excessive amount of time is needed for routine control work, and some methods require complicated and expensive equipment not usually found in a control laboratory. A search for a new method to correct these difficulties resulted in a procedure using the uranyl ion as a precipitating agent, forming insoluble uranyl carboxymethylcellulose. The use of this procedure on a variety of sodium carboxymethylcellulose samples has shown a minimum recovery of 98% sodium carboxymethylcellulose and a precision within ±0.01 on the D.S. A comparison of the D.S. obtained by this method and other available methods has shown a maximum difference of 0.04. The method has been found particularly useful in routine control analysis, as a total time of only two to four hours is required without special equipment or experience. 4 tables and 6 references. E.S.

TIMELL, T. E. Studies on carboxymethylcelluloses. IV. Fractionation as a method for studying the uniformity of carboxymethylcelluloses. Svensk Papperstidn. 56, no. 9: 311-23 (May 15, 1953). [In English; German and Swedish summaries] *cf.* B.I.P.C. 23: 711.

The chemical uniformity of several carboxymethylcelluloses has been studied by fractionation procedures. Fractional precipitation was found to take place according to both chemical constitution and molecular weight. This method, when applied to a technical carboxymethlycellulose, showed the material to be rather nonuniform in both these respects. Application of a summative fractional-solution procedure employing aqueous methanol solutions resulted in fractions varying more in degree of substitution (D.S.) than in molecular weight. This method was applied to three commercial carboxymethylcelluloses and to a series of 10 others prepared by carboxymethylation of cotton linters for varying lengths of time. Generally, the samples investi-

gated consisted of three parts, i.e., a minor portion exhibiting a high D.S. and low D.P., which probably represented the material that had been most accessible in the alkali cellulose; a large fraction of considerable chemical uniformity; and a third portion which had a lower average D.S., was very nonuniform, and probably, more crystalline than the others. The second fraction, and accordingly the over-all uniformity of the whole specimen, increased with the D.S. In several cases samples of similar average D.S. and D.P. were found, in spite of similar water solubility, to differ considerably when fractionated, and in other cases similarity in D.S. and D.P. did not prevent the specimens from displaying a very different solubility in water. As the chain-length distribution was probably approximately the same throughout, these facts indicated the great influence of the degree of chemical uniformity of the samples. Correlation of the results obtained by fractionation with those noted by application of the method previously developed for estimating the distribution of the substituents within the anhydroglucose units suggested that the latter procedure was able to differentiate only between products of very different chemical constitution. The nonuniformity of the samples studied is briefly discussed and interpreted in terms of longer or shorter sections of unchanged chain molecules, still held more or less firmly together by hydrogen bonds. Finally, it is pointed out that a direct proof of the existence of such localities in carboxymethylcelluloses with poor solubility properties would be highly desirable. 16 tables, 6 diagrams, and 19 references. E.S.

CHEMICAL TESTING—PULP—ACID NUMBER

ANT-WUORINEN, OLLI. On the gravimetric estimation of the carboxylic acid group in cellulose. Paper and Timber (Finland) 35, no. 4: 186-8 (April, 1953). [In English] *cf.* B.I.P.C. 22: 168-9.

The author criticizes the method of Farrar, Neale, and Williamson for the gravimetric estimation of carboxyl groups in cellulose (I). He provides evidence that the uranyl groups are not sufficiently attached to the cellulose, so that the uranyl-carboxyl bonds can break up as a result of the action of distilled water used to wash the cellulose after soaking; in addition, the salt formation between cellulose carboxyl and uranyl groups is not the only possible linkage between the two. Hence, results obtained with (I) are bound to be misleading. 2 tables and 4 references. E.S.

KONOW, RUBEN VON. The acid properties of cellulose. Paper and Timber (Finland) 35, no. 5: 220-8 (May, 1953). [In German]

A review of the acid properties of cellulose, including both the reaction of the hydroxyls of cellulose with alkali and the behavior of the cellulosic acids, containing carboxyl groups produced by oxidation, is given. Hydroxyls, carboxyls, and carbonyls all contribute to the proton potential ("Protonendruck") of the cellulose. This is lowered when cellulose is dried from neutral faintly acid solution resulting from the formation of lactones and lactides which revert to the free-acid form slowly in the presence of alkalies. The author points out experimental precautions to be observed in studying these properties, precautions in regard to the purity of the water, the pretreatment of the cellulose, especially the removal or retention of "zero-fiber" fractions, the determination of pH, and the ion-exchange properties of cellulose. 14 references. K.W., Jr.

CHEMICAL TESTING—PULP—PENTOSANS

SMITH, EDGAR D., and ROGERS, L. N. Determination of pen-

tosans in highly purified wood pulps. Anal. Chem. 25, no. 6: 931-3 (June, 1953).

A more accurate, as well as a more precise, method for the determination of pentosans in highly purified wood pulps was sought. By means of newly developed analytical techniques it was shown that the present TAPPI Standard T223 m-48 method for the determination of pentosans is not suitable for application to highly purified wood pulps. The authors suggest that the present method be modified as follows: The distillation rate should be reduced to 1.5 ml./minute; the total quantity of distillate collected should be reduced to 200 ml.; for pulps in the range 0.5 to 2% of pentosan, an aliquot of the distillate should be diluted 1:10 with distilled water; and the ultraviolet light absorption at 277.5 mμ should be read directly against a distilled water blank. Using a calibration curve established with pure furfural, the quantity of total aldehyde (furfural plus hydroxymethyl furfural) may be calculated. A formula is given from which the true percentage of pentosans may be calculated. 6 tables and 4 references. R.A.S.

CHLORINE

KENYON, RICHARD L., and GALLONE, PATRIZIO. Chlorine and caustic in Italy; amalgam cell production. Ind. Eng. Chem. 45, no. 6: 1162-72 (June, 1953).

The de Nora amalgam cell and a typical Italian installation with a daily capacity of 50 tons of chlorine using the de Nora type 20-T cell with a rated capacity of 12,000 amp. are described. Differences between Italian and U. S. operating conditions are pointed out, based on relative costs of electricity, steel, and labor. Electrical power is cheaper than steam power in Italy, a land of mountains and water and with little coal. Steel is of limited availability and much of the corrosion-resistant constructional material is made of concrete or ceramics. Syenite, a naturally occurring stone, is used in the electrolysis cell. Cheap labor influences the modes of operation; instrumentation is minimized. Since the last war, the amalgam cell has been installed extensively in Europe, South Africa, Australia, and South America and is now enjoying a great increase in popularity in the United States. Five plants with an approximate total production of 400 tons/day of chlorine were placed in operation or were under construction in 1952. Nearly all of them use the Monsanto-de Nora cell adapted to American conditions. No special problems are involved in its operation; no evaporation or purification steps are needed to make pure caustic of 50 to 70% concentration. 5 tables, 1 flowsheet, 10 figures, and 17 references. E.S.

MASON, E. A., BAUER, W. C., and QUINCY, R. R. Explosions in chlorine absorption systems. Tappi 36, no. 11: 274-8 (June, 1953).

During a study of explosions occuring in absorption systems used for the preparation of chlorine bleaching solutions from cell gas, the lower explosive limits for mixtures of hydrogen, chlorine, and air were determined. The presence of explosive mixtures of these gases in the absorption towers was established and traced to the stripping of chlorine from the feed gas. Ignition may have been due to static electricity. The use of an air bleed into the system and of an antifoaming agent in the spray water has been successful in eliminating serious explosions. 1 table, 3 figures, and 11 references. E.S.

CHROMATOGRAPHY

CUENDET, L. S., MONTGOMERY, R., and SMITH, F. Cellulose

sheets as chromatographic supports. J. Am. Chem. Soc. 75, no. 11: 2764-5 (June 5, 1953).

In the separation of relatively large amounts of sugars in admixture a 5-cm. cellulose strip (I) about one-eighth inch thick was used as the chromatographic support. The chromatograms were developed horizontally within a glass tube 100 mm. in diameter and closed at either end with aluminum-covered rubber stoppers. T-glass pieces inserted in the tube formed supports for (I). The developing solvent was contained in a cylindrical dish at one end of the tube and was led to (I) by means of an absorbent cotton bridge. The high loading capacity of (I) and the fact that sugars and their methyl derivatives can be successfully separated makes the method useful. A special spray reagent (ethylleucine hydrochloride in butanol) was required. When butanol-ethanol-water was used as the developing solvent, R_f values on (I) were invariably much higher than those obtained with Whatman No. 1 paper. 1 table and 11 footnotes. L.E.W.

FRENCH, DEXTER, and WILD, GENE M. Correlation of carbohydrate structure with papergram mobility. J. Am. Chem. Soc. 75, no. 11: 2612-16 (June 5, 1953).

The regularity of the papergram mobilities of homologous oligosaccharide series leads to a straight-line characteristic for each series when the logarithm of a partition function, α', is plotted against molecular size. The partition function is obtained from single- or multiple-ascent papergrams. These observations can be correlated into the generalization that an increase in the size of a saccharide by one hexose unit will decrease the papergram mobility by an amount which depends on the type of hexose unit being added and on its mode of attachment. Examples given include oligosaccharides of the starch, dextran, levan, insulin, and galactan types. 6 graphs and 21 footnotes. E.S.

RAO, P. S., and DICKEY, E. E. Horizontal migration method of paper chromatography. Science 117, no. 3050: 666-7 (June 12, 1953).

This is an improvement of the technique devised by Rao and Giri (*cf.* J. Indian Inst. Sci. 34: 95 [1952]). The method, which provides for a direct positional identification of known and unknown substances, is very rapid, but sugars in admixture can only be separated when the difference in circular R_f values of any two components is greater than 0.06. A good separation of rhamnose, xylose, galactose, and lactose was effected. 3 figures and 5 references. L.E.W.

CLEANING COMPOSITIONS

BLANCHARD, DAVE. Cleaning operations in paper and board mills 1920-1952. Paper Mill News 76, no. 19: 20, 22 (May 9, 1953).

The author discusses paper- or board-mill cleaning with synthetic detergents under production cleaning (such as the conditioning of felts or suction press rolls and the elimination of slime and other contaminants from the system) and maintenance cleaning (removal of grease from machinery and floors and the prevention of industrial dermatitis in hand cleaning through the provision of proper washroom facilities equipped with detergents of adequate cleansing power). E.S.

COLORIMETRY

INGLE, G. W., and RUDICK, L. A comparison of the MacAdam and the Adams-Nickerson indexes of color differences. J. Opt. Soc. Amer. 43, no. 6: 501-4 (June, 1953).

A simplified version of the MacAdam equation for color difference is presented. It is used in comparison with the Adams-Nickerson index for hypothetical colors in I.C.I. space and for colors of selected plastic samples. The two indexes disagree seriously, except when the color difference involves differences in only one and the same chromaticity co-ordinate. Visual estimates of color differences shown by plastic samples show preferential agreement with the MacAdam index. The suggestion is made that this simplified MacAdam formula be given a wider trial. 2 tables, 5 figures, and 5 references. E.S.

MACADAM, D. L. Dependence of color-mixture functions on choice of primaries. J. Opt. Soc. Amer. 43, no. 6: 533-8 (June, 1953).

The shape of the color-mixture curve for any primary is completely determined by the choice of the line in the chromaticity diagram representing the additive mixture of the other two primaries. Formulas for the linear combinations necessary to transform one set of color-mixture curves to another are given in terms of the slopes and axis-intercepts of the lines joining the new primaries, represented in the chromaticity diagram based on the original color-mixture functions. Orthogonal color-mixture functions are defined and an example is given, in which one of the color-mixture functions is proportional to the luminosity function. Formulas for deriving all other orthogonal sets of color-mixture functions are given. The importance of the concept of orthogonality in the analysis of the propagation of errors in spectrophotometric colorimetry is discussed. 6 diagrams and 6 references. E.S.

NIMEROFF, I. Propagation of errors in spectrophotometric colorimetry. J. Opt. Soc. Amer. 43, no. 6: 531-3 (June, 1953).

An important part of the basis of instrumental colorimetry, the uncertainty of spectrophotometric data, has been neglected in the investigations of color and color specification. The uncertainty of measurement of spectral data results from recurrent and random fluctuations, such as slit-width and stray-energy effects and photometric-scale and wavelength-scale effects. By means of the theory of propagation of errors in a computed result the variances in each of the I.C.I. chromaticity co-ordinates are determined. As the chromaticity co-ordinates are correlated, the covariance between x and y is also determined. Uncertainty ellipses are formed by assuming that the variates have normal distributions about their mean values with the determined covariance matrix. These ellipses have been computed for a representative series of colors for the special case of constant spectral uncertainty and are compared with the perceptibility ellipses of MacAdam. As in visual colorimetry, an instrumental measurement of chromaticity co-ordinates does not establish a single point on the chromaticity diagram, but rather indicates that the true chromaticity point probably lies within an elliptical area surrounding this point. 1 figure and 5 references. E.S.

CORROSION

THIEDE, R. C. Corrosion prevention and control. Southern Pulp Paper Mfr. 16, no. 5: 60-4 (May, 1953).

The author, the chief field engineer responsible for the construction and repair work of a large chemical company, discusses some of the corrosion problems encountered in his work, as well as the approaches employed for their solutions. Pipe lines and valves, lead equipment, upkeep painting, cleaning processes and routine, and testing under field conditions are considered. The need for adequate tests in the application of alloys before large investments involving the use of such alloys are made is stressed. E.S.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Pricing and estimating. Article 10. Summary procedures for cost and estimating systems in the boxboard container industry. Boxboard Containers 71, no. 726: 29-32 (June, 1953); *cf.* B.I.P.C. 23: 715.

Cost elements and rates for the boxboard container operation are determined at three levels of information. The first level is a summary analysis of payrolls, including costs of direct productive labor and machine or equipment activity; the second is job-cost data, including such items as materials, storage, and delivery; and the third is a summary and comparison of job costs and actual costs, along with examination of an inventory account. This information, recorded in tabular form continuously, should serve to warn managements to make adjustments before losses occur. 5 illustrations of cost-estimating forms. R.A.S.

COTTON LINTERS

BURDYNSKI, RALPH F., and KOBE, KENNETH A. Alpha-cellulose from solvent extracted cotton linters. Tappi 36, no. 6: 248-54 (June, 1953).

Cellulose with a high alpha content is produced by digesting cotton linters with a solution of caustic soda. When the cotton wax is removed first by solvent extraction, the linters are penetrated quickly and uniformly by the digestant, and the digestion process requires a shorter time, lower temperature, or lower caustic soda concentration. The extracted wax may be recovered easily as a valuable by-product. Raw and dewaxed cotton linters were digested with caustic soda solution in a stainless steel digester. The properties of the cellulose produced from the two materials were determined. Chemical cotton produced from solvent-extracted linters shows a definite improvement in quality over that produced from raw linters. A high-viscosity chemical cotton can be produced from extracted linters by employing milder digestion conditions than would be possible in the case of raw linters. 8 tables, 7 figures, and 19 references. E.S.

DIFFUSION

NARAYANAMURTI, D., and KUMAR, VIDYA B. Diffusion of organic molecules through wood. J. Polymer Sci. 10, no. 6: 515-24 (June, 1953). [French and German summaries]

The diffusion of alcohols, glycerol, phenol, and formic, acetic, and butyric acids through four species of Indian timbers (*Bombax malabaricum* or semul, *Cullenia excelsa* or karani, *Calophyllum tomentosum* or poon, and *Cedrela toona* or toon) in the water-saturated condition has been studied, and the results are reported. In contrast to several inorganic ions, Fick's law is obeyed by the organic molecules in the concentrations studied. As is to be expected, the diffusion in the axial direction is several times that in the other direction. The speed of diffusion decreases rapidly with the molecular weight

of the substance and the density of the wood. Although in the case of the alcohols the logarithm of the diffusion constant varies as the molecular weight, in the case of acids, the diffusion constant is proportional to the molecular weight. 5 tables, 4 figures, and 3 references. E.S.

DIGESTERS

DUGGAN, H. W., MCDONALD, C. A., and MCGRATH, R. V. Exhibit I, II, III. Excerpts from an analysis. Digester lining analysis. Pulp Paper Mag. Can. 54, no. 6: 182-8 (May, 1953).

The first exhibit gives formulas for determining the total net stress in the ceramic lining and steel shell of the digester, the second develops the formulas when subjected to tension far beyond the tensile strength of the lining, and the third takes into consideration subjection to internal temperature and pressure. These exhibits are given in correlation with the following article, "Design of ceramic-lined digesters" by C. A. McDonald. 5 illustrations and 2 references. R.A.S.

MCDONALD, C. A. Design of ceramic-lined digesters. Pulp Paper Mag. Can. 54, no. 6: 174-82 (May, 1953).

A ceramic-lined steel digester is a vessel made of materials possessing widely different properties and subjected, in operation, to pressure and temperature variations. By proper combination, the vessel and lining can be compatible within certain limiting conditions, beyond which failures will and have occurred. The type of failure is determined by the pressure existing between the outer surface of the lining and the inner surface of the vessel. An insufficient pressure may result in failure of the lining by cracking in tension; an excessive pressure may result in compressive buckling of the lining or rupture of the vessel in tension. A criterion has been developed which predicts the effect, either singly or in combination, of the various factors involved. This makes possible a rational method of determining whether a particular combination of ceramic lining, vessel, and operating conditions will be succesful. The vessel fabricator, the lining applicator, and the operator each has within his control important factors affecting the success of a digester; hence, each must understand his responsibility and act accordingly. 1 table, 13 figures, and 4 references. E.S.

SCHEIL, MERRILL A. Hastelloy alloy F—a new corrosion-resistant alloy for lined digesters. Tappi 36, no. 6: 241-7 (June, 1953).

Hastelloy alloy F is a new corrosion-resistant alloy based on the nickel-chromium-molybdenum-iron system with a balanced chemical composition. The alloy contains the following essential elements: carbon, 0.08% max.; chromium, 21 to 23%; nickel, 44 to 47%; molybdenum, 5.5 to 7.5%; and columbium and tantalum, 1.75 to 2.5%. The alloy possesses good resistance to pitting, stress-corrosion cracking, and crevice-type corrosion. The fabrication properties of the alloy are satisfactory for welded construction, and it is produced in sheet, plate, and bar form. The mechanical and physical properties of the alloy are somewhat similar to the austenitic stainless steels, giving the alloy adequate ductility for forming and welding in the construction of lined vessels. The outstanding application of this new alloy has been in lined digesters used for preparing sulfite pulp. Exposure tests of the alloy in alkaline digester service indicate that it may have desirable properties for use in both acid and alkaline digester service. 7 tables, 14 figures, and 2 references. E.S.

ELECTRIC PRECIPITATORS

ANON. First new type Cottrell precipitator for Union Bag & Paper Corporation. Southern Pulp Paper Mfr. 16, no. 5: 114-15 (May, 1953); *cf.* B.I.P.C. 23: 634.

Recent installations of wet-bottom precipitators and the principle of the wet-bottom system are described briefly. 1 flowsheet and 1 illustration. E.S.

ENZYMES

JERMYN, M. A. Fungal cellulases. III. *Stachybotys atra:* growth and enzyme production on non-cellulosic substrates. Australian J. Biol. Sci. 6, no. 1: 48-69 (February, 1953); *cf.* B.I.P.C. 23: 552.

The course of growth on sucrose, starch, and both buffered and unbuffered glucose media has been followed. Enzymes with β-glucosidase activities were produced on all media and the presence of substrates containing β-glucosidic linkages was unnecessary for the production of activity stimulating the "C_x enzyme" (enzyme-splitting, polymeric, β-glucosidic linkages) of Reese, Siu, and Levinson (*cf.* B.I.P.C. 20: 706-7). High activity for the hydrolysis of salicin and sodium carboxymethylcellulose appears in the medium at and just after the germination of the mold. In unbuffered media a second maximum is associated with the attainment of maximum mycelial weight. Enzymic activity against the *p*-nitrophenyl-β-glucoside does not appear to be closely correlated with the other two activities. The meaning of these results is discussed in terms of the hypothesis of multiple β-glucosidase activities and the nonexistence of the specific "C_x" enzyme. 9 tables, 8 diagrams, and 25 references. E.S.

EUCALYPTUS

STEWART, C. M., AMOS, G. L., and HARVEY, L. JOSEPHINE. Chemical studies on *Eucalyptus regnans* F. Muell. Australian J. Biol. Sci. 6, no. 1: 21-47 + 2 plates (February, 1953).

Samples of the outer phloem, inner phloem, cambial zone, developing sapwood, sapwood, and heartwood of young *Eucalyptus regnans* F. Muell. trees have been examined for extraneous materials, lignin, and carbohydrate constituents. The hexose carbohydrate increases from less than 12% in the cambial zone to less than 46% in the outer phloem and to less than 58% in the xylem. Hexose carbohydrate deposition is essentially completed in the developing sapwood. The apparent Klason lignin increases from 12% in the developing sapwood to 25% in both the outer phloem and the heartwood; however, the calculated "true" lignin rises from less than 1% in the cambial zone to about 10% in the phloem and to about 25% in the mature xylem. The calculated values indicate that lignification commences in the developing sapwood and is completed in the sapwood. The ratio of pentosan-uronic acid anhydride is 2:1 in the phloem, 6:1 in the xylem, and about 1:1 in the cambial zone. Very little of the uronic acid anhydride is associated with pectineous material. The concentration of sugars in the fluids of the inner phloem, cambial zone, and developing sapwood is of the order of 1%, whereas that in the sapwood and heartwood is very low: this suggests that rapid cell growth is restricted to the cambial-developing sapwood region. In the sapwood and heartwood there is, respectively, sufficient and insufficient water to fill all "free" spaces. The aqueous phase in the cambial zone contains at least 1% of inorganic salts. All tissues are slightly acidic; the strongest acids occur in the outer phloem. The extraction of the zonal samples with 80% ethanol causes very little hydrolytic degradation and the undifferentiated and partly differentiated elements are rich in ethanol-soluble materials. Tannins are present in minimal

amounts in the cambial region and their concentration in the "sap" fluids increases on either side of the cambium. Proteins are plentiful in the cambial and adjacent tissues. The relatively high protein, sugar, and soluble mineral matter contents of the outer phloem are consistent with the observation that the "bark" of the samples examined is composed largely of living cells. The effect of the method of drying the samples on subsequent analytical data indicates that it is inadvisable to employ material oven-dried at or around 105°C. 13 tables, 1 diagram, 8 photomicrographs, and 42 references. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

ANON. Consolidated opens anti-pollution plant. Paper Mill News 76, no. 18: 7-8 (May 2, 1953).

The Rosenblad reversible-flow, quadruple-effect evaporator has been placed in operation at the Interlake mill of Consolidated Water Power & Paper Co., Appleton, Wis. The installation is expected to handle the mill's entire supply of collectible spent sulfite liquor from nine Mitscherlich digesters at approximately 13.3% solids content and to concentrate it to 60% solids for use as a boiler fuel. The experience gained at Appleton will be used in making plans for processing the spent sulfite liquor in the company's considerably larger sulfite mill at Wisconsin Rapids. 1 flowsheet and 3 illustrations. E.S.

FEED WATER

GILWOOD, M. E., and CALMON, C. Mixed bed vs two-step demineralization of high pressure boiler feed water. Paper Trade J. 136, no. 21: 22-5 (May 22, 1953); Can. Chem. Processing 37, no. 7: 36, 38, 40 (June 20, 1953).

Data are presented which indicate that both two-step demineralization (I) and mixed-bed demineralization (II) can produce treated waters having approximately the same residual silica contents. A low residual silica content seems to be obtained more readily with (I) than (II). Economic considerations indicate that (II) should be considered when waters of low total solids (30-75 p.p.m.) are treated; for a higher level, (I) seems to be preferable. If iron is present in the raw water, additional costs will be incurred when (II) is employed. 2 tables, 6 figures, and 3 references. E.S.

FIBER—STRUCTURE

FREY-WYSSLING, A. The submicroscopic structure of elementary cellulose fibrils. Experientia 9, no. 5: 181 (May, 1953). [In German; English summary]

There is a difference of the diameter of elementary fibrils in cellulose measured with the electron microscope or determined by x-ray analysis. This is explained by the assumption that the elementary fibrils have a well crystallized interior covered by a paracrystalline peripheral layer. 14 references. E.S.

RÅNBY, B. G. Recent studies on the morphology of cellulose fibers and their significance for fiber to resin bonding. Tappi 36, no. 6: 8A, 10A, 12A, 14A (June, 1953).

The author reviews some of the recent work on the morphology and chemical composition of cellulosic fibers, including ultrasonic-treatment studies; the original presentation was accompanied by the showing of a number of slides. In conclusion, a brief reference is made to the fundamental possibilities of applying resins to fiber surfaces. 15 references. E.S.

FIRE PREVENTION

HÄGGLUND, ARNE. The experience gained from the fire and explosion damage of the wallboard mill at Ljusne, March 26, 1952. Part 1. Svensk Papperstidn. 56, no. 10: 378-83 (May 31, 1953). [In Swedish]

Experts from three different agencies investigated the possible reasons for the explosion and disastrous fire in a Swedish wallboard mill to prevent, if possible, the reoccurrence of similar conditions in other board mills of this type. The verdict of the state testing station considered heat generated by friction in one of the ventilating fans in the tunnel drier the possible reason. The Swedish steam boiler association found the conditions of the electrical equipment unsatisfactory and believed a defect of this type the possible cause. O. Brauns of the Swedish Forest Products Laboratory and T. Nordensson of the mechanical testing station in Stockholm studied the sprinkler system and temperature conditions in the tunnel drier and arrived at the conclusion that a combination of local overheating and the accumulation of combustible gases may have led to the original explosion, followed by the fire. The fire insurance commission which studied the damage and the different reports believed the third interpretation the most plausible one. 10 figures. E.S.

FLOCCULATION

BEASLEY, D. E. Fiber flocculation. Pulp & Paper 27, no. 5: 58, 60 (May, 1953).

The author studied some of the variables which affect fiber flocculation with the aid of a modified Wollwage tester (*cf.* B.I.P.C. 9: 355-6); the variables included consistency, temperature, hydrogen-ion concentration, refining action, pulping method and species, chemical additives (alum, surface-active agents, sodium hexametaphosphate, and colloidal agents), and air in stock. The flocculation tester was so constructed that a photographic record of the tests could be made. The following results were obtained: Consistency and temperature increases and fibrillation were found to increase the flocculation tendency. Hydrogen-ion concentration and the addition of surface-active agents or hexametaphosphate had no measurable effect, whereas the addition of alum in a concentration sufficient to lower the pH to 4.6 or that of mannogalactan, as well as reduction of air content decidedly decreased the tendency to flocculate. Temperature, alum, and mannogalactan are the most effective inhibiting agents, particularly temperature. A reduction of 20°F. increases the flocculation time by 35 seconds. Alum and mannogalactan at optimum concentrations are only half as effective as a reduction in temperature. 4 references. E.S.

FLUID DYNAMICS

DIEKMAN, ROBERT, and FORSYTHE, W. L., JR. Laboratory prediction of flow properties of fluidized solids. Ind. Eng. Chem. 45, no. 6: 1174-7 (June, 1953).

Successful circulation of fluidized solids as a dense phase depends on keeping the solids aerated. If allowed to deaerate, the solids rapidly lose fluidity. A laboratory method has been developed with used cracking catalysts for predicting the dense-phase flow of fluidized solids in commercial-scale standpipes. The method involves measurements of the viscosity and the deaeration rate of a fluidized bed. Solids which increase more slowly in viscosity during deaeration have better flow quality. Coarse particles of high density adversely affect flow behavior. Wide size distributions are not needed to maintain good

flow; average particle size is the controlling factor. 2 tables, 5 figures, and 11 references. E.S.

GILLILAND, E. R., MASON, E. A., and OLIVER, R. C. Gas-flow patterns in beds of fluidized solids. Ind. Eng. Chem. 45, no. 6: 1177-85 (June, 1953).

The effect of the flow pattern of the gas is important in fluidized-solid reactors. In previous studies on the residence-time history of the fluidizing gas, a technique was developed whereby the effect of nonuniformities in gas flow can be predicted for first-order homogeneous reactions. To study the influence of gas-flow patterns on chemical reactions of higher order, the oxidation of nitric oxide, a third-order reaction, has been carried out in small fluidized beds. The measured conversion of reactants has been compared with that predicted from known kinetics, residence-time data, and certain assumptions regarding the gas-flow pattern. The experiments were carried out in glass reactors using spherical glass beads (Scotchlite) as the fluidized solid. Preliminary work showed that the presence of these beads had a negligible effect on the reaction under the conditions chosen. The progress of the reaction was measured photometrically. For comparison, the residence-time history of gas flowing through the same apparatus was determined. It was found that knowledge of the residence-time distribution of the gases flowing through a reactor provides a good method for estimating the effect of gas-flow pattern on homogeneous reactions in fluidized beds. 4 tables, 11 figures, and 11 references. E.S.

FOAM

ANON. Provides 'foamless fill' of open top milk containers. Packaging Parade 21, no. 245: 110-12 (June, 1953).

A brief description of the S & D Filler, a pneumatic machine, and its operation is given. This machine has a nozzle which extends into the container, so that filling takes place from the bottom and foaming is avoided. The filler can be used with a variety of types of prefabricated paper containers for milk; it was developed by William Shanhouse and Ernest Daehr. 6 illustrations. R.A.S.

WIRPSA, A. J. Fighting foam in the paper industry. Paper Mill News 76, no. 20: 116, 124 (May 16, 1953).

Following a brief discussion of the causes and harmful effects of foam in the pulp, paper, and board industries, chemical defoamers in the form of pastes, solids, and liquids, and their application are described. Petroleum solvents, such as kerosene and fuel oil, are probably the oldest types of defoaming agents known; however, they can only be used in mills where they do not present an odor problem. Many kraft pulp mills have discontinued the use of kerosene, because it is hard to remove by washing. Liquid defoamers are the most recent development; they are easier to handle than paste and solid types and are not affected by freezing or deterioration, if left uncovered for any length of time. The application can be made at many points, and it is difficult to determine the most suitable place. Some mills have been able to cut costs and eliminate foam effectively by varying the points of application. E.S.

FORESTS AND FORESTRY

ANON. Conservation forester!!! Who is this man? Southern Pulp Paper Mfr. 16, no. 5: 48-50 (May, 1953).

The activities of a conservation forester are outlined. E.S.

BLACK, ROBSON. Canadian Forestry Association teaches a large class. Pulp Paper Mag. Can. 54, no. 6: 207, 209 (May, 1953).

The organization of this association and its work in the past 52 years are described. R.A.S.

DEMMON, E. L. Georgia's forest survey shows new trends. Paper Ind. 35, no. 2: 188-90 (May, 1953).

Statistical information obtained from the second forest survey in Georgia conducted by the Southeastern Forest Experiment Station is presented and compared with data from the first survey made in 1934-36. Pulpwood drain is now approaching 30% of the total pine drain, exceeding current growth, whereas the opposite is the case with hardwoods. Publicly owned forests, as well as those owned by the pulp industry, are generally well managed. It is the small independent farmer who—as a rule—is not doing a good job in forestry. The education of individual farmers who own the bulk of the land presents a real challenge to public agencies and the pulp and paper industry. Other current station projects of interest to the industry include the control of wood properties through tree breeding or genetics and an investigation of the feasibility of salvaging sawmill and logging waste for use by the pulp and board industries. The station's Forest Utilization Service acts as a liaison activity between the Forest Products Laboratory in Madison and the southeastern forest industries. 5 tables and 1 map. E.S.

GILMOUR, JOHN D. Where are we now in forest management? Pulp Paper Mag. Can. 54, no. 6: 227-8, 231-2, 235, 238, 240 (May, 1953).

Forestry developments in other parts of the world are mentioned to show what private landowners have been doing to advance the industry in an attempt to seek allowance for private enterprise to grow timber crops in Canada. The author criticizes the Canadian government ownership of more than 80% of the productive land area, particularly the type of land tenures in British Columbia. Some favorable developments have occurred since the Sloan Commission reported. However, many things have happened since then which could not have been foreseen in 1943. The appointment of another Royal Commission to study the changed conditions is considered essential. R.A.S.

HOWELL, WALLACE E. Forests in relation to rainfall. Pulp Paper Mag. Can. 54, no. 6: 212, 214, 216, 218 (May, 1953).

The effect of rainfall on the forests (an insufficient amount stunting growth and increasing fire hazard), the effect of the forest on the rainfall (from 40 to 60% being caught by foliage and returned to the atmosphere), and rainfall stimulation, an examination of experiments, and future possibilities are discussed. 8 references. R.A.S.

MCLAREN, C. G. Wisconsin forest management. Pulp & Paper 27, no. 6: 68-9, 72 (June, 1953).

Following a brief historical review of the activities of the state of Wisconsin in forestry matters during the past 50 years, the author discusses present ownership, wood consumption by paper mills with particular reference to the forest-management plans of the National Container Corp. at Tomahawk, the sound-forestry-promoting activities of Trees for Tomorrow, and goals for the future. 6 illustrations. E.S.

MALSBERGER, H. J. Work of the conservation foresters. Southern Pulp Paper Mfr. 16, no. 5: 50, 119 (May, 1953).

The title of conservation forester is given to a forester employed by the pulp and paper companies which are members of the Southern Pulpwood Conservation Association and which are promoting improved forest practices among the small landowners in the South. Conservation foresters devote most of their time to providing direct services to the landowner, suggesting ways and means to grow continuous crops of trees at a greater financial return. Their recommendations are free of charge and place the owner under no obligation. Although pulpwood averages only about 18% of the total use of southern forest products, every acre must be kept fully productive to insure a continuous supply of wood to the lumber and related wood-using industries. Hence, members of the Southern Pulpwood Conservation Association consider it good business to employ more than 100 conservation foresters who help the small landowner to grow more wood. E.S.

PEPLER, W. A. E. Protecting the forests from all evils. Pulp Paper Mag. Can. 54, no. 6: 202-4 (May, 1953).

The present manager of the Woodlands Section of the Canadian Pulp and Paper Association reviews work done in the past 33 years in the field of forest conservation and replenishment, as well as present services and activities. R.A.S.

GASES

PERRY, ROBERT H., and PIGFORD, ROBERT L. Kinetics of gas-liquid reactions; simultaneous absorption and chemical reaction. Ind. Eng. Chem. 45, no. 6: 1247-53 (June, 1953).

Although rates of gas absorption accompanied by chemical reaction in the liquid have been calculated kinetically for certain simple cases, no estimates have been made for the technically important cases involving second-order chemical kinetics. The differential equations involving transient accumulation, diffusion, and reaction terms are well known; however, no solutions have been obtained. Using a digital computer, these equations are solved for a number of cases, and the results are found to be in accord with experiment. The results, represented as the ratio of the local mass-transfer coefficient with reaction to that without, are found to depend on the rate and chemical equilibrium constants, the ratio of reactants, and the time of exposure of the liquid surface. 1 table, 13 figures, and 4 references. E.S.

HEAT

CHEMICAL ENGINEERING. Heat technology. Chem. Eng. 60, no. 6: 175-238 (June, 1953).

An over-all report on heat technology is presented, covering the five main aspects of production, containment, transport, transfer, and application. The authors and titles of the individual articles are as follows: Chilton, Cecil H., and Olive, Theodore R. Introduction, p. 175-6, 185; McCabe, Joseph C. Fuels—choice and handling, p. 186-9—2 references; Jensen, W. Paul. Combustion theory and practice, p. 190-4, 221; Chilton, Cecil H. Electric heating methods, p. 195-9; Rescorla, Charles L. Refrigeration and refrigerants, p. 200-7; Bliss, Charles. Tubular process furnaces, p. 208-12; Hoover, Morgan M. Metals for extreme temperatures, p. 212-15—6 references; Norton, C. L., Jr. Refractories for every use, p. 216-20; Thomas, Ray, and Turner, W. C. Insulation for heat and cold, p. 221-5 (*cf.* B.I.P.C. 23: 809); Carberry, James J. Media for heat transport, p. 225-8—8 references; Bonilla, Charles F. Ad-

vances in heat transfer, p. 228-32—38 references; and Smith, Julian C. Trends in heat exchangers, p. 232-8. A three-color folded chart showing the thermal spectrum in heat technology is included, and numerous tables and figures are given in most of the articles. R.A.S.

HEATING

LUBINSKY, RICHARD G. Rules for proper steam blast coil installation. Tappi 36, no. 6: 279-83 (June, 1953).

Most troubles encountered with steam coils on industrial applications can be traced back to improper installation. The author outlines the common causes of failure and explains why coils fail under different conditions. Rules to be followed to realize long satisfactory economical service from heat-transfer surfaces are established, with emphasis on the fact that it may cost slightly more to base the initial installation on a thorough consideration of fundamentals, but that it will prove more economical in the long run. The cost of making repairs during shutdowns and of lost production can be tremendous. Air must be thoroughly vented from the heating surface and condensate must drain freely into the return system. When these two conditions are not fulfilled, early failure may be expected from either corrosion, rupture caused by different expansion of the tubes, breakage resulting from excessive pressure from water hammer, or rupture caused by freezing. 15 figures. E.S.

HEATING (INFRARED)

LHÉRAULT, J. Use in the paper industry of infrared radiation obtained by [the combustion of] propane. Assoc. tech. ind. papetière, Bull. no. 3: 69-73 (1953). [In French]

The author outlines the use of radiant heat supplied by the complete combustion, in air, of propane in the presence of appropriate catalysts, in the Schwank apparatus (I) (which is described briefly). (I) appears to be more effective, and far sturdier, than the electrical infrared equipment (II) tested by the author. (I) was used quite satisfactorily in drying tracing paper and in actually improving its quality; it also served very well in causing the very rapid interaction of two reagents in a test paper (generating oxygen), and here (I) functioned far more rapidly than did (II). Other papers dried by (I) included a plastic-coated paper and wall papers. 2 figures. L.E.W.

INORGANIC PAPER

MA, T. S., and BENEDETTI-PICHLER, A. A. Papers made from inorganic fibers as filter mats for Gooch crucibles. Anal. Chem. 25, no. 6: 999-1000 (June, 1953).

Directions for the use of filter paper prepared from glass fiber (*cf.* B.I.P.C. 22: 911) in analytical work are given. Grade X-934-AH made by the Hurlbut Paper Co. was used in the experiments. E.S.

INSTRUMENTATION

WALTER, LEO. Progress in automatic control. Paper Ind. 35, no. 3: 334-6 (June, 1953); Indian Pulp and Paper 7, no. 11: 519-21 (May, 1953); *cf.* B.I.P.C. 23: 410.

Several automatic control methods applied to pulp- and papermaking equipment are described; some of these were already listed in the previous reference. 6 diagrams in the first and 2 in the second reference. E.S.

INSULATION AND INSULATING MATERIALS

OWENS-CORNING FIBERGLAS CORPORATION, *Toledo, Ohio.* Pipe wrapped in glass blanket. Chem. Eng. 60, no. 6: 250 (June, 1953).

The advantages of Aerowrap, a Fiberglas resilient wrap-around insulation for pipes, flanges, fittings, and valves, and methods of application are described. Its use is not recommended for temperatures over 600°F.; on cold lines a sealed vapor-barrier jacket is required to prevent condensation or frost or ice formation on the pipes. Aluminum foil laminated between kraft paper is recommended for this purpose and is sufficient for lines not subjected to abuse. For outdoor or indoor lines exposed to severe conditions a protective jacket of black roofing felt, white asbestos paper-faced felt, corrugated aluminum sheet, or rolled galvanized sheet metal should be provided. 2 illustrations. E.S.

THOMAS, RAY, and TURNER, W. C. Insulation for heat and cold. Chem. Eng. 60, no. 6: 221-5 (June, 1953).

Thermal-insulation materials and application methods must be selected for the service requirements of an installation. A table listing the characteristics of the common industrial insulating materials is included. Economic thickness, reflective insulation, the use of a vacuum, and the additional problem of extreme low temperatures are also discussed. 2 tables and 1 figure. E.S.

LIGNIN

ADLER, E., and BJÖRKQVIST, K. J. Synthesis and reactions of α-(3-methoxy-4-hydroxyphenyl)-glycerol ("guaiacylglycerol"). I. Preliminary experiments. Acta Chem. Scand. 7, no. 4: 561-9 (1953).

α,β-Dibromo-hydroferulic acid methyl ester has been prepared and converted into the corresponding β-hydroxy and β-acetoxy derivatives. Attempts to replace the α-bromine atom in these derivatives by acetoxyl were unsuccessful. On acetylation both derivatives yielded α-bromo-β-acetoxy-acetylhydroferulic acid, in which the bromine is easily replaced by acetoxyl. Similar attempts to obtain hydroxy and acetoxy derivatives of hydroferulic acid and its acetate are described. Whereas ferulic acid and methyl ferulate are readily brominated in the side chain, the corresponding acetyl compounds proved to be inert towards bromine. 2 figures and 9 references. E.S.

ADLER, E., and YLLNER, S. Synthesis and reactions of α-(3-methoxy-4-hydroxyphenyl)-glycerol ("guaiacylglycerol"). II. Synthesis. Acta Chem. Scand. 7, no. 4: 570-81 (1953).

α-(3-Methoxy-4-hydroxyphenyl)-glycerol ("guaiacylglycerol") has been prepared by lithium aluminum hydride reduction of α,β-diacetoxy-acetylhydroferulic acid methyl ester. It was obtained as a noncrystallizing sirupy mixture of the two possible D,L-forms. Acetylation yielded the two D,L-tetraacetyl derivatives in a crystalline state. Methylation with diazomethane gave "veratrylglycerol" which was converted into its triacetate. The latter products were not resolved into the corresponding D,L-forms. The oxidation of guaiacylglycerol with periodate has been examined. On heating guaiacylglycerol with aqueous bisulfite solution (pH 3) the hydroxyl group in the position *alpha* to the aromatic nucleus was replaced by sulfonic acid; a crystalline barium salt of the sulfonic acid was obtained. 3 figures and 10 references. E.S.

RICHTZENHAIN, HERMANN, and DRYSELIUS, ELISABETH. On the existence of acid soluble lignin. Svensk Papperstidn. 56, no. 9: 324-7 (May 15, 1953). [In German; English and Swedish summaries]

To check recent work, particularly that of Campbell and McDonald on acid-soluble and modified lignins (*cf.* B.I.P.C. 23: 103), lignin (I) determinations with sulfuric acid were carried out on spruce-, beech-, and aspenwood samples for detecting the presence or absence of certain (I) fractions in the wood hydrolyzates. Spectrophotometric measurements in the ultraviolet range (carried out by the present authors) show that the filtrate of acid (I) contains only very small quantities of (I). The authors emphasize that the solutions for the spectrophotometric evaluation should not be heated (as Campbell and McDonald did) to avoid the formation of carbohydrate conversion products (furfural, oxymethylfurfural, reductic acid, etc.) which exhibit a very strong ultraviolet absorption in a similar range as (I). The changes in absorption values by heating of wood hydrolyzates were compared with those obtained with glucose and xylose solutions in 3% sulfuric acid before and after boiling. The results indicate that the sulfuric acid hydrolyzates of the three wood species investigated do not contain any appreciable quantities of (I) and that the insoluble acid (I) includes practically the entire (I) fraction present in wood. 5 diagrams and 12 references. E.S.

MACHINERY

MORDEN, R. BURKE. Stock preparation equipment. Parts I and II. Paper Trade J. 136, no. 17: 14-22; no. 18: 21-8 (April 24, May 1, 1953).

Following a brief discussion of the fundamentals involved in stock preparation (fiber structure, hydration, effect of treatment on paper properties, freeness or drainage, and the three phases of defibering—i.e., pulping, brushing or beating, and shortening or jordaning), the author describes the different types of equipment used for this purpose, including roll-type beaters, jordans, conical and disk refiners, and pulpers, as well as cycling and continuous systems of stock preparation and the problem of the treatment of mixed furnishes. The second part of the article deals with the construction and mode of operation of equipment made by the Morden Machines Co., including the Stockmaker for beating, the Stuff-maker for jordaning, and the Slush-maker for pulping. 23 figures. E.S.

PULP AND PAPER MAGAZINE OF CANADA. Affiliated industries. Pulp Paper Mag. Can. 54, no. 6: 292, 294, 297, 299-300, 302 (May, 1953).

Brief histories of some of the original advertisers (or their successors) in the *Pulp and Paper Magazine of Canada* are presented, including The Canadian Fairbanks-Morse Co. Ltd., The B. Greening Wire Co. Ltd., The Johnson Wire Works Ltd., The Niagara Wire Weaving Co. Ltd., Sherbrooke Machineries Ltd., and Union Screen Plate Co. of Canada Ltd. E.S.

MACHINERY—CONVERTING MACHINERY

STURKEN, R. C., and EGAN, L. W. Machinery for coating paper with plastics. Tappi 36, no. 6: 38A, 40A, 42A, 44A, 46A, 50A, 52A, 54A, 56A (June, 1953).

The types of equipment specifically used for coating paper with plastics are

reviewed under the headings: conventional equipment for applying suspensions and solutions of plastic resins (coating machines and driers and ovens), adaptations of conventional coating machines for hot-melt application of low- to medium-viscosity resins, new extrusion-fed equipment for hot-melt application of high-viscosity resins, and new equipment for direct extrusion-lamination process of high-viscosity, film-forming resins. 14 figures and 30 references. E.S.

MACHINERY—CORRUGATING MACHINE

WERNER, A. W. Instrumentation on corrugators. Fibre Containers 38, no. 5: 78, 80-2, 84 (May, 1953).

The author discusses the possible applications of instruments to the corrugator, including automatic caliper control, moisture recorders, web control, speed control, tachometers, heat control, temperature recorders, corrugating-roll pressure recorders, glue-film indicators, web-tension indicators, viscometers, and miscellaneous gages. As corrugating speeds tend to increase, the use of control instruments will become a necessity. E.S.

WILSON, HARRY. The Wilson steam system. Fibre Containers 38, no. 1: 58, 60, 64-5 (January, 1953); *cf.* B.I.P.C. 22: 501.

Following a brief discussion of the principles of heat transfer, the author describes the advantages of the Wilson steam system for the economical operation of corrugators; without increasing steam pressures, the system can produce higher ultimate temperatures on the product than any corrugator not equipped in this manner. 1 diagram. E.S.

MACHINERY—DRYERS

BROUGHTON, D. B., and MICKLEY, H. S. Design of full-scale continuous-tunnel driers. Chem. Eng. Progr. 49, no. 6: 319-24 (June, 1953).

A new method of designing continuous-tunnel driers is presented, based upon a simple experimental test in which the stock is exposed to the same sequence of drying conditions as it would in a full-scale continuous unit. This test directly determines the drying history of the stock as it passes through the proposed drier. The results are substantially independent of any assumptions concerning the mechanism of the drying process. The experimental equipment required is simple and inexpensive, and the tests may be performed by nontechnical people who have received minimum training. 3 tables, 9 diagrams, and 5 references. E.S.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Evaporation of water in dryers. Pulp Paper Mag. Can. 54, no. 6: 198-9 (May, 1953).

The curves of data sheets G-12 and G-12a (issued June, 1953) are reproduced; they show the number of pounds of water evaporated by a drier section/pound of paper dried. 2 diagrams. E.S.

WANNERBERG, H. The ventilation of cylinder drying machines for pulp. Svensk Papperstidn. 56, no. 10: 366-73 (May 31, 1953). [In Swedish]

The author describes several totally enclosed cylinder driers with heat recovery installed in Swedish sulfite and sulfate mills, including constructional

details and materials, corrosion problems, instrumentation, the resulting improved over-all heat economy of the drying process, and the improved ventilation and working conditions for the crew in the machine room. 14 figures. E.S.

MACHINERY—ELECTRIC EQUIPMENT

BUSH, C. W. A modern paper mill electrical installation. Paper Trade J. 136, no. 16: 36-8 (April 17, 1953); *cf.* B.I.P.C. 23: 35.

The source of all power at the St. Regis Kraft Center at Cantonment, near Pensacola, Fla. is steam provided by natural gas-fired, bark-burning, and chemical-recovery boilers. Electric power is obtained as a by-product from the large quantities of steam used in pulp processing and drying and generated by two turbo-generators. Details of the different electrical installations (approximately 190 individual motor units), power-distribution system, paper-machine and winder drives, and master-control station are described. 4 illustrations. E.S.

EDSALL, ROBERT G. Maintenance and inspection of electrical equipment. Southern Pulp Paper Mfr. 16, no. 5: 44-6, 119 (May, 1953).

The scheduled program of inspection and cleaning of all electrical equipment, including machinery and lighting fixtures, at the Westinghouse plant at East Pittsburgh is outlined. Routine inspection is the most effective means of preventing serious power outages and work stoppages. E.S.

MACHINERY—PAPER MACHINE

ANON. Thilmany improvements include new Beloit Fourdrinier. Paper Mill News 76, no. 17: 22-3 (April 25, 1953).

A brief description is given of the 120-inch Beloit combination kraft-glassine paper machine which started operation at the Thilmany mill in Kaukauna, Wis. on March 10, 1953. It includes several innovations in construction and is designed for a speed of 1200 f.p.m. 2 illustrations. E.S.

CORBIN, W. S. New improvements on high speed Fourdriniers. Paper Trade J. 136, no. 15: 19-20 (April 10, 1953); Can. Pulp Paper Ind. 6, no. 6: 12, 14 (June, 1953); Paper Mill News 76, no. 29: 80, 82 (July 18, 1953).

Three definite trends in paper-machine construction are indicated for the period from the early 20's; the first trend was to increase width with no appreciable increase in speed, the next was a reversal to narrower, higher-speed machines, and the present trend is a combination, wider and wider machines running at increasingly faster speeds. Each of these trends created operating and constructional problems on the Fourdrinier machine. The author discusses a few of the outstanding developments under the two groups: physical (roll design and balance, deflectors, suction-couch rolls, wire guides, run of the wire, and wire changing) and papermaking (sheet transfer, suction-couch air velocities, and elimination of shakes and adjustable pitch). E.S.

MACHINERY—PAPER MACHINE—YANKEE TYPE

ANON. Expansion continues as new machine installed. Can. Pulp Paper Ind. 6, no. 6: 16, 18 (June, 1953).

A brief reference is made to the starting up of a new Beloit 135-inch straight Yankee machine at Westminster Paper Co. Ltd., which will be

operated as a dry crepe machine and increase the mill capacity by about 60%. Some of the outstanding features of the new (third) unit are mentioned. 1 illustration. E.S.

MACHINERY—PRINTING MACHINE

ANON. Nabisco swings to Cottrell rotaries. Boxboard Containers 71, no. 726: 22-5 (June, 1953).

The National Biscuit Co. has installed three Cottrell high-speed, five-color, sheet-fed, rotary boxboard presses in its carton plant at Beacon, N.Y. to replace 15 two-color flatbed letterpresses. Features, such as double-pile delivery, better distribution of color, shorter time to pull a set of progressive proofs, ample control stations, control of offset with units which spray Oxy-Dry powder, and pneumatic throwoff contribute to the success of the equipment. 5 illustrations. R.A.S.

MACHINERY—SAWS

JONES, STEWART. How Champion Paper & Fibre Co. developed a dustless saw for slicing cement. Paper Trade J. 136, no. 15: 24 (April 10, 1953).

Since no saw of this type was available on the market, members of the company built a rig from a circular saw with carbide teeth set to run at very low speed. The saw was used in a wall-wrecking job in the paper-machine room while all machines kept on running at full speed. 2 illustrations. E.S.

MACHINERY—SCREENS

SEGRING, S. BERTIL. Screening problems in the wallboard industry. Svensk Papperstidn. 56, no. 10: 363-5 (May 31, 1953). [In Swedish; English summary]

The particular character of pulps used for the manufacture of wallboard and the quality required from the finished product place certain demands on the screening stage. In spite of these facts, no special screens have been developed for this purpose, but those in use in the pulp and paper industry are employed. Fiberboard pulps are rather free, contain large quantities of fiber bundles, and show a high tendency for floating and felting. The screening of such pulps depends primarily upon their freeness, dilution, fiber agglomeration, temperature, etc. and, in addition, on the manufacturing process and degree of defibration. Several layouts of screening arrangements, including one- and two-stage screening, are shown. The screening process is an excellent means for the mixing of different furnishes. The most suitable consistency, size of screen slots, and power consumption for different types of screens (coarse, centrifugal, inward- and outward-flow, and vibrating screens) and for various kinds of wallboard are discussed. Auxiliary equipment includes consistency regulators and sand traps. 2 tables, 3 diagrams, and 11 references. E.S.

MATERIALS OF CONSTRUCTION

ANON. Nylon shows high wear resistance in processing of pulp and paper. Paper Mill News 76, no. 20: 128 (May 16, 1953).

Excellent results were obtained with tips machined from Polypenco nylon rod and used in the flow nozzles of the Bauer Centri-Cleaner; these nozzles are constantly immersed in the pulp and paper stock where they are subject

to abrasive and corrosive wear. All other parts of the cleaner assembly are manufactured from interchangeable molded hard rubber. 2 illustrations.
E.S.

METALLIZING PROCESS

ANON. Metallizing in the paper mills. Paper Trade J. 136, no. 22: 19-20 (May 29, 1953).

The metallizing process, equipment used, and representative jobs in pulp and paper mills are described briefly. 3 figures. E.S.

MATTSSON, CARL H. Metal spraying is gaining ground. Svensk Papperstidn. 56, no. 10: 388-9 (May 31, 1953). [In Swedish]

The spraying with Metcoloy I of a badly corroded suction cylinder, 3 m. in diameter and 4 m. in width and provided with 160,000 perforations, without removal from its location is described. The entire repair in a Finnish groundwood mill required about one month and cost approximately 15% of the amount for a new cylinder; an inspection of the sprayed surface after an operating period of six months did not show the slightest sign of corrosion. 5 illustrations. E.S.

MILL CONSTRUCTION

INGRAHAM, HAROLD G. Economic and engineering problems involved in building new mills. Tappi 36, no. 6: 145-7A (June, 1953).

The author discusses the mechanics in laying out a paper-mill process and the design of the required buildings, with particular reference to the role of the consulting engineer in any expansion program. His function is to supplement the mill staff and assume the burden of handling the multitude of details involved in any major job. Over-all planning and the final decisions and approval of plans should be retained by the mill management and its own engineers. The use of flow diagrams to study operations during the preliminary planning stages is recommended; these diagrams are subject to constant revisions until a workable process has been developed. The paper-mill consultant will then bring into the picture engineers experienced in other branches (structural, electrical, illuminating, steam, hydraulic, mechanical, and architectural) and co-ordinate their judgment and experience with that of the mill engineers. The resulting decisions should assure a well-planned project, which will attain the objectives of mill management at lowest cost. E.S.

MILL MANAGEMENT

AUSTIN, RICHARD S. Maintenance of buildings. Southern Pulp Paper Mfr. 16, no. 5: 57-9 (May, 1953).

The author discusses briefly the life expectancy of buildings under different sets of conditions and the need for semiannual inspections which should cover the following items: piles and foundations, structural framework, walls and copings, floors and drains, roofs and flashings, windows and glazing, partitions, painting, plumbing, electrical work, heating, and fire and safety inspections. An annual budget of all repair costs should be prepared so that management may have an opportunity to review the total cost of rehabilitation *vs.* the possibility of a new construction. 1 table. E.S.

CROSSLEY, T. LINSEY. Before we became technical. Pulp Paper Mag. Can. 54, no. 6: 163-6 (May, 1953); *cf.* B.I.P.C. 11: 54.

The author, who was one of the first chemists in the paper industry, describes his experiences with personalities whose knowledge was acquired by experience and jealously guarded and conditions in the mills in the days before the coming of technical workers. R.A.S.

DECEW, JUDSON A. Half a century of paper mill chemistry. Pulp Paper Mag. Can. 54, no. 6: 166-7 (May, 1953).

The work of the paper mill chemist from the beginning of his use in the industry is described. 1 illustration. R.A.S.

KELLER, J. A. Job evaluation . . . building the wage and salary structure. Part 5. Paper Ind. 35, no. 3: 343-4 (June, 1953); *cf.* B.I.P.C. 23: 646.

Directions for gearing the wage and salary plan to the proper relationship between company and area rates, the salary level best suited to the needs and means of the company, and the proper relationships between jobs in the company are given. A graphic correlation chart for setting up the salary grades is included, and its application is explained. 1 chart. E.S.

MOLDED PULP ARTICLES

LINDENFELSER, R. A new resin for the resin pulp molding industry. Tappi 36, no. 6: 20A, 22A, 24A, 26A, 28A; discussion: 34A, 36A, 38A (June, 1953).

An excellent review of the development of the resin-pulp molding process is presented, with particular emphasis on preform compositions which have a sufficiently high resin content (20-70%) to render plastic character to the moldable preform and to provide rigid moldings with durability similar to commercial melamine and phenolic compounds. Most of the resins listed are dark in color and not stable to light, which may be one of the fundamental reasons why the industry has not grown to greater size. The introduction of a new light-colored resin with light-stable characteristics (benzoguanamine resin) (I), its properties, and possible applications are described; it is available on an experimental basis from the Plastics Department of the American Cyanamid Co. By the use of (I) unlimited colors are possible, ranging from white to delicate pastels to rich yellows, greens, and blues. In addition, its electrical-insulating properties should vastly increase the scope of the resin-pulp, preform-molding process. 1 table and 52 references. E.S.

MOTION STUDIES

KITTELSEN, HARALD. Time and motion studies for determining the required size of the crew and the normal production in a grinder room. Norsk Skogind. 7, no. 5: 143-8 (May, 1953). [In Norwegian; English summary]

The author describes time and motion studies in a Norwegian grinder room of medium size. The total working time is divided into actually productive time, unavoidable delays, and allowances for personal needs, including allowances for fatigue. The method used for determining the different time intervals from which the total time at normal production per shift is built up is described in detail. Calculations for finding the required number of workers at normal production and under conditions when extra help has to be added are given. 3 tables and 3 figures. E.S.

NEWSPRINT

ANON. Sawgrass in the Florida Everglades as source of pulp for newsprint. Southern Pulp Paper Mfr. 16, no. 5: 38, 40, 42 (May, 1953); Paper Ind. 35, no. 2: 201-2 (May, 1953).

Reference is made to test runs through the high-speed Goss press of the *Tallahassee Democrat* with 100% Celsedge newsprint (produced in the Herty laboratory from sawgrass fiber collected in the vast Everglades of Florida). The process is admittedly in the laboratory stage. If present plans materialize, a $500,000 pulp mill of hurricaneproof structure will be built near Belle Glade in the heart of the Everglades; five sixths of the construction will be in the open. The idea of producing paper from sawgrass is not new. A plant for this purpose was set up at Leesburg, Fla. about 30 years ago, but the product could not compete with standard newsprint on an economical basis. The present sawgrass project is being pushed by Carl L. Sackett, who was connected with the earlier operation, and Joseph G. Weimer of Montevideo, Uruguay. Amphibious harvesting machinery has been developed for collecting the sawgrass which can be cut two or more times annually. Roughly five tons of sawgrass are required to produce one ton of pulp. A comparatively small area would supply the proposed mill for all time. The sponsors estimate that they can produce newsprint of a marketable quality at about $80.00/ton.

E.S.

PACKAGING

ANON. Package design shouts . . . "California here we come." Packaging Parade 21, no. 245: 48-9, 51, 57 (June, 1953).

Golden State Co., Ltd., San Francisco dairy-products firm, has recently installed an entire new line of packaging. The uniformity of color and design patterns for the different types of milk, butter, cheese, orange juice, etc. cartons is described. 13 illustrations. R.A.S.

ANON. Paper built this business. Paper & Twine J. 27, no. 3: 9, 27 (May, 1953).

The Josse Ice Creamery in St. Louis has found the use of liquidtight paper containers, tall cylindrical half-gallon packages, to be successful in expanding its business. 1 illustration. R.A.S.

HARDY, WALTER L. Testing food packages and food packaging materials. Tappi 36, no. 6: 152-4A (June, 1953).

The author recommends the testing of the product in the proposed package under the most extreme conditions, comparable to those to be found in the shipping and storage of the particular item, accelerated if necessary. The basis of the test should be an organoleptic evaluation of the product before and after testing. The importance of clarity and simplicity in package design is stressed, and the need for considering color-blind shoppers is pointed out. Packing materials and procedures must also be taken into account. E.S.

MODERN PACKAGING. Armour meat products. Modern Packaging 26, no. 10: 112-17, 225-7 (June, 1953).

In a history of the company Armour & Co. is paid tribute as the largest packager in the meat industry. Recognized as the outstanding contribution of the company is the development of the flexible vacuum package used first for bacon in 1948. Prepackaging, which now includes almost all kinds of meat products, has made them available for self-service retailing. 22 illustrations.

R.A.S.

WOLPER, P. K. Converted paper packaging materials. Tappi 36, no. 6: 151-2A (June, 1953).

Modern converting methods, including various processes of surface coating and laminating, for improving flexible packaging materials for the food industry are discussed. 1 table listing the moistureproofness of different sheet materials. E.S.

WOODCOCK, C. M. Packaging for the food industry. Tappi 36, no. 6: 150-1A (June, 1953).

The author very briefly stresses the importance of proper packaging in the food industry, the necessity of using materials with the required functional properties, and the advantages of aesthetic appeal. E.S.

PAPER—COATED

NAZZARO, R. T. [Chairman] Panel discussion—Problems in applications of resins to paper. Tappi 36, no. 6: 70A, 72A, 74A, 76A (June, 1953).

Joseph Pullman cited examples where the properties of resins were used in developing a method of resin application. Paul Yoder discussed problems connected with hot-melt coatings. Norman Greenman dealt with beater conditions, Duroid 700 in particular, and Joseph Aid mentioned special problems in the utilization of plastics in the paperboard industry, where the methods developed in the paper industry are not always applicable. Each presentation was followed by questions from the floor and answers from participating members. E.S.

VOKES, R. F. Methods of reverse roll coating. Tappi 36, no. 6: 64A, 66A, 68A, 70A (June, 1953); *cf.* B.I.P.C. 21: 711.

The development of reverse roll coaters, which led to the construction of the "Contracoater," its advantages, and mode of operation are outlined. 1 table, 5 figures, and 7 references. E.S.

PAPER AND PULP INDUSTRY

ANON. Danes made paper in 1576. Can. Pulp Paper Ind. 6, no. 6: 52 (June, 1953).

Denmark's first paper mill was founded at Hvidore in 1576; about 300 years later, there were 20 mills in the country. At present, there are 12 mills in operation which produce approximately 90,000 tons or 45% of the country's annual requirements. The rest is imported, principally from the other Scandinavian countries. The Danish per capita consumption is about 100 pounds/person. 3 illustrations. E.S.

ANON. The paper industry of Argentina. Svensk Papperstidn. 56, no. 10: 390-2 (May 31, 1953). [In Swedish]

The pulp and paper industry of the country is reviewed, including a listing of the most important mills and statistical data on production and imports. The 52 mills house approximately 75 paper machines. The principal raw materials employed comprise wood (willow, poplars, eucalyptus, and conifers), straw, bagasse, and bamboo. 7 tables and 1 illustration. E.S.

DYCK, A. W. J. Processing and manufacturing trends in south-

ern pulp and paper. Paper Ind. 35, no. 2: 166-73 (May, 1953).

The history of the southern pulp and paper industry covers a period of only 50 years. Today there are 89 mills in operation or under construction in the 12 southern states with a total estimated daily output of 32,000 tons of pulp for 1953. The former concept that the southern manufacturing facilities would be used indefinitely for the production of low-cost, standard paper grades and paper products no longer holds. There is currently no pulp or paper mill product which cannot be manufactured in volume output by the southern mills, should the market demand it. The author reviews recent trends in the southern pulp and paper industry, with particular reference to newsprint production, power generation, wood handling, pulping, bleaching, paper machines, lubrication, ventilation, utilization of chemicals, and elimination of air and stream pollution. 2 tables and 12 illustrations of prominent southern mills. E.S.

MANLEY, LEANDER. Industry had early start in British Columbia. Pulp Paper Mag. Can. 54, no. 6: 155-6 (May, 1953).

The growth of the pulp and paper industry in Canada's most western province from 1894 to the present is described. 2 tables and 3 illustrations. R.A.S.

SPROULL, REAVIS C., and STEVENS, ROBERT H. Some economic aspects of the development of the paper industry in the South. Paper Ind. 35, no. 2: 174-9 (May, 1953).

This survey includes the 12 southern states: Alabama, Arkansas, Florida, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Tennessee, Texas, South Carolina, and Virginia. Statistical information compiled from reliable sources on the pulp and paper industry in these states, drain on forest resources, and effect on the general economy is presented. The fundamental reason for the movement of the paper industry into the South was the large supply of available coniferous wood and a continuing potential supply to be expected as a result of the mild climate and an adequate rainfall. With good forest management, the same basic reasons will assure the future of the industry. 9 tables and 6 diagrams. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. Kalamazoo paper school has 55 students—2 research projects. Pulp & Paper 27, no. 6: 38, 40 (June, 1953); *cf.* B.I.P.C. 22: 263.

The growth of the paper division at Western Michigan College and recent developments are discussed. 5 illustrations. E.S.

SOLLIE, H. CHR. The technical school at Horten and the new papermaking course. Norsk Skogind. 7, no. 5: 150-1 (May, 1953). [In Norwegian]

A brief outline of the curriculum of the new department at the Horten technical school (founded in 1855) is given. 1 illustration. E.S.

PAPER AND PULP INDUSTRY—TRANSPORTATION

TOMBS, GUY. Recollections of a one-time freight agent. Pulp Paper Mag. Can. 54, no. 6: 157-60 (May, 1953).

Problems and costs of transportation in Canada's pulp and paper industry during the past 52 years are reviewed by a railway official. 4 tables and 1 illustration. R.A.S.

PAPER AND PULP MILLS

ANON. Latest expansion program completed at Halifax Paper. Paper Trade J. 136, no. 19: 16-22 (May 8, 1953); Southern Pulp Paper Mfr. 16, no. 6: 54, 56, 58, 60, 62, 64, 66 (June, 1953); Pulp & Paper 27, no. 6: 62-4, 66 (June, 1953); *cf.* abstract next page.

Similar descriptions of the new installations of the kraft pulp and paper mill at Roanoke, N.C. are given as in the following article by Eaton; the three articles are not identical and include 1 flowsheet and 12 illustrations in the first and third references, and 16 illustrations in the second. E.S.

ANON. Moraine Paper Company—it is still as modern as it was five years ago. Pulp & Paper 27, no. 6: 50-2, 55 (June, 1953); *cf.* B.I.P.C. 23: 342-3.

The installations of the West Carrollton mill of the company, a division of The American Envelope Co., are described, with particular reference to the new 10-roll Black-Clawson calender stack with several unique features. 7 figures. E.S.

ANON. Powell River's additions. Pulp & Paper 27, no. 6: 96-7 (June, 1953).

The company's three-year construction program, representing a continuation of the expansion initiated in 1945, will be completed in 1953. During the past year the following projects were carried out or are now being completed: the speeding up of four paper machines, construction of a new barker plant with Hansel ring-type hydraulic barker, two new Waterous magazine grinders, new chip silos, the construction of a new deep-sea dock, the installation of a new Brown Boveri steam turbine and a new Babcock & Wilson boiler, facilities for handling hog fuel, and a 13-mile, double-circuit transmission line from the hydroelectric power plant at Stillwater to the mill at Powell River. 4 illustrations. E.S.

ANON. Progress made at all divisions of Rayonier. Paper Trade J. 136, no. 20: 38-43 (May 15, 1953).

The recent plant improvements at the Shelton Division (dissolving pulp by the ammonia-base sulfite process), Grays Harbor Division (pulp and paper), Port Angeles Division (dissolving pulp), all three in the state of Washington, and Fernandina Division, Fla. (dissolving pulp) of Rayonier Inc. are reviewed; the first three utilize principally western hemlock, the fourth, southern pine as the raw material. The construction of a new dissolving-pulp mill at Jesup, Ga. is mentioned. The plant is expected to start operation in 1954 and will utilize an improved process developed by the company. Much of the equipment, including digesters and recovery boilers, will be installed out-of-doors. Rayonier's five principal brands of dissolving pulps, each with its own process and market, include: Rayaceta for acetate yarn; Purayonier for cuprammonium rayon, sponges, etc.; Rayocord for high tenacity yarns, tire cords, conveyor belts, etc.; Hicolor for regular viscose rayon; and Rayamo for cellophane. In addition, the company produces Raybond and Raybook pulps for the manufacture of fine papers and also makes over 30,000 tons of fine papers annually. A brief history of the growth of the company is included. 9 illustrations. E.S.

CHRISTIANSEN, J. T. 25,000-ton project nearing completion "Down Under." Paper Ind. 35, no. 3: 328-30 (June, 1953); *cf.* B.I.P.C. 23: 738.

Full production of the 25,000 annual-tons sulfate, bag-paper, and linerboard mill now under construction at Kinleith, N.Z. is expected before the end of 1953. A condensed outline of the pulp- and papermaking facilities is given, including six vertical digesters with Morterud indirect heating systems, Impco brown-stock washers, a Delthirna sizing system, a Walmsleys paper machine, a Kamyr pulp drier for surplus pulp, a five-effect evaporator with Rosenblad system, and a conventional Dorr causticizing system. 5 illustrations. E.S.

EATON, T. D. Halifax expansion program completed; new 246" Beloit machine installed. Paper Mill News 76, no. 23: 10-12, 14-16, 19, 26 (June 6, 1953).

The $6,000,000 modernization and expansion program of the Halifax Paper Co. at Roanoke Rapids, N.C. includes a new stock-preparation system, a new 246-inch Beloit kraft Fourdrinier machine, and a new water system. The designed capacity of the new stock-preparation system is 250 tons of pulp/day; it involves an Oliver saveall, Emerson jordans, and a Shartle Hydrapulper under the calender stack to take dry broke from the last drier, calender, or reel. The new machine is designed to operate at 2500 f.p.m. and to produce 270 tons of kraft-bag, converting, wrapping, and other lightweight papers, as well as paperboard. The new 6,000,000-gal./day water plant includes a settling and filter system, as well as a large flocculating tank. All water for the papermaking process and pulp washing is clarified in the flocculator. The paper machine is housed in a new building which was designed to permit installations without interrupting or slowing down the current mill production. Necessary alterations were also made to the existing paper mill to integrate its production with the new facilities. 1 flowsheet of the water-treatment plant and 14 illustrations of mill and equipment. E.S.

SCONCE, R. E. Weyerhaeuser expansion completed. Paper Mill News 76, no. 17: 10-12, 14-21 (April 25, 1953).

The Weyerhaeuser Pulp Division now includes the magnesia-base sulfite mill, a bleached sulfate mill, and a kraft paper and board mill at Longview, a sulfite and bleached sulfate mill at Everett, a kraft linerboard mill at Springfield, Ore., and a hardboard mill under construction at Klamath Falls, Ore. The author reviews the recent additions and extensions to existing units in the Longview and Everett mills. 21 illustrations of the equipment and buildings. E.S.

SOUTHERN PULP AND PAPER MANUFACTURER. St. Regis Paper Company's new mills at Jacksonville, Florida in operation. Southern Pulp Paper Mfr. 16, no. 5: 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88 (May, 1953); *cf.* B.I.P.C. 23: 654.

The identical description of the mill as in the previous reference is given; a list of principal equipment suppliers is appended. 18 illustrations of the mill and equipment. E.S.

PAPER MACHINE OPERATION

KASSING, B. L. [Moderator] Wet end operating conditions and paper qualities. Tappi 36, no. 6: 139-45A (June, 1953).

Individual discussions emphasized the special properties desired, problems encountered, and unusual operating conditions required for five different grades of papers, with particular reference to similarities and contrasts. The authors and titles of the papers are: Moss, L. A. Wet end operating conditions and paper qualities—rag bond, p. 139-40A; Foote, W. J. Wet end operating conditions and paper qualities—coating base, p. 140-2A—14 references; Sabatke, Lawrence. Wet end operating conditions and paper qualities—sulphite papers, p. 142-3A; Rusch, R. D. Wet end operating conditions and paper qualities in a kraft mill, p. 143-4A; Parkinson, Leonard. Wet end operating conditions and paper qualities—glassine and greaseproof, p. 144-5A; and Kassing, B. L. Wet end operating conditions and paper qualities—summary, p. 145A. E.S.

PAPER SPECIALTIES

ANON. Lithoed gummed paper specialties. Natl. Lithographer 60, no. 5: 26-9 (May, 1953).

The many uses and wide market for gummed paper are discussed, including suggestions for printing by offset lithography and storage. 2 charts and 2 figures. R.A.S.

BARRY, A. J. Properties and uses of silicones. Tappi 36, no. 6: 18A, 20A; discussion: 34A, 36A, 38A (June, 1953).

Following a brief discussion of silicone chemistry and the interaction of organosilicon compounds and cellulose, the author describes applications in the paper industry, particularly for making products (rainwear, diapers, packaging materials, liners for baking pans, etc.) abhesive; as impregnating agents for capacitor papers, lens-cleaning tissues, and nonsticking tips for cigarettes; and as laminating agents for papers based on glass, mica, asbestos, rock wool, or other mineral fibers. Greases for high-temperature applications, antifoaming agents, and mold-release emulsions form additional uses of these compounds. 1 table and 9 references. E.S.

BURKE, THOMAS. 1953 marks centenary of vegetable parchment. Paper & Paper Products 94, no. 18: 1, 22 (June 5, 1953).

A brief account of the discovery and development of vegetable parchment, together with its uses and applications, is given. R.A.S.

PAPER SALES. Aluminum foil and foil products. Paper Sales 13, no. 6: 12-14, 43-5 (June, 1953).

Modern uses of aluminum foil, foil laminates, and foil containers, available types, markets, cost, and physical and chemical properties of the foil are discussed. The laminates (combinations with papers, board, films, cloth, etc.) account for the largest share of packaging applications; they are usually prefabricated into bags, envelopes, cartons, carton liners, trays, wrappers, and labels. 5 illustrations. R.A.S.

REITER, R. W. Some applications of vinyl acetate polymers to paper. Tappi 36, no. 6: 60A, 62A, 64A (June, 1953).

A number of methods for applying vinyl acetate polymers (I) to paper are outlined, including beater and size or calender additions, impregnation or saturation, lamination, and coating. The properties of (I) are discussed; they are commercially available in the form of emulsions, solvent solutions, hot-melts, and dry and alkali-soluble compounds. Information on compounding and copolymerization of polyvinyl acetate emulsions is included. The application

of these polymers for greaseproofing is perhaps of greatest interest at this time. 3 tables. E.S.

PERIODICALS

CAMPBELL, ROY L., and DAWES, A. L. The editor does double duty. Pulp Paper Mag. Can. 54, no. 6: 146-7 (May, 1953).

A former editor and secretary of the Canadian Pulp and Paper Association recall significant events in the years from 1914 to 1921. R.A.S.

STEPHENSON, J. N. 1903—A magazine was born to grow with an infant industry. Pulp Paper Mag. Can. 54, no. 6: 141-5 (May, 1953).

The editor-in-chief covers the highlights of the early days of the *Pulp and Paper Magazine of Canada* and the events marking the pulp and paper industry's struggles during the period from 1903 to 1912. 2 illustrations. R.A.S.

PHYSICAL TESTING—PAPER—MACHINE DIRECTION

ANON. How to determine the grain direction of paper. Paper & Twine J. 27, no. 3: 14 (May, 1953).

Two simple methods of determining the grain direction of paper, the tear test and the fold test, are described. 2 figures. R.A.S.

PHYSICAL TESTING—PULP—SURFACE AREA

TROITZSCH, H. Determination of the external specific surface of native cellulosic pulps. Assoc. tech. ind. papetière, Bull. no. 3: 83-8 (1953). [In French]

The Clark-McEwen silvering technique (I) was applied in determining the specific surfaces (II) of the following unbeaten pulps: an unbleached kraft, a bleached maritime pine sulfite, a bleached chestnut pulp, and another bleached pine sulfite pulp. (II) found were respectively: 12,500 (±500), 8200 (±500), 18,100 (±300), and 10,300 (±200) sq. cm./gram. Although in general the precision of (I) was satisfactory, in the case of some highly purified pulps, when disintegration was poor, the results for (II) fluctuated widely. Results obtained with (I) compared quite favorably with the fundamental nitrogen-absorption technique (at −195°C.) (*cf.* Escard and co-workers, B.I.P.C. 22: 480). In addition to (I), two other methods were applied: (*a*) the liquid permeability method (*cf.* Robertson and Mason, B.I.P.C. 20: 396) and (*b*) the dye-absorption technique of Beamesderfer and co-workers (*cf.* B.I.P.C. 23: 40-1). In the case of a beaten bleached sulfite pulp, the rate of increase of (II), with beating, was determined by all three methods, and the results showed good agreement. The correlation between the degree of beating and paper strength developed by Corte (*cf.* B.I.P.C. 22: 561) is discussed at some length. 1 table, 6 figures, and 16 references. L.E.W.

PLASTICS

SCHMIEDER, A. K., and DIKEMAN, H. G. Selected plastics references for the mechanical engineer, 1951-1952. Mech. Eng. 75, no. 6: 477-80 (June, 1953); *cf.* B.I.P.C. 22: 685.

This review covers recent developments in plastic materials, properties, fabrication techniques, and applications. 132 references. R.A.S.

PLASTICS—TESTING

GRAVES, F. L. Evaluating abrasion resistance of resin-paper laminates by the Armstrong Abrader. Tappi 36, no. 6: 28A, 30A, 32A, 34A; discussion: 34A, 36A, 38A (June, 1953); Am. Boxmaker 42, no. 7: 14-17 (July, 1953); Am. Paper Converter 27, no. 7: 21-3, 64 (July, 1953).

Following a definition of the difference between abrasion and wear resistance, the advantages of the Armstrong Abrader, its construction, and application to the measurement of the abrasion resistance of resin-paper laminates are outlined. 7 figures and 3 references. E.S.

MARK, H. F. Some recent progress in measuring adhesion of films to metal plates. Tappi 36, no. 6: 16A; discussion: 16A, 18A (June, 1953).

A German method developed by K. Wolf and collaborators for measuring the adhesion of plastic and rubbery films on metals or other rigid-base materials, such as glass or wood, is outlined. E.S.

POLYSACCHARIDES

WHITE, E. V., and RAO, P. S. Constitution of the polysaccharide from tamarind seed. J. Am. Chem. Soc. 75, no. 11: 2617-19 (June 5, 1953).

The polysaccharide isolated from the seed kernel of *Tamarindus indica* has been converted into the methyl ether derivative and the latter subjected to methanolysis. The glycosidic components of the resulting sirup have been separated and identified as derivatives of 2,3,4-trimethyl-D-xylose (1.06 parts), 3,4-dimethyl-D-xylose (1.07 parts), 2,3,4,6-tetramethyl-D-galactose (1.02 parts), 2,3,6-trimethyl-D-glucose (0.86 part), and 2,3-dimethyl-D-glucose (1.96 parts). On the basis of these components, consideration is given to structural arrangements which may describe the repeating unit of the macromolecule. 17 footnotes. E.S.

PRINTING AND PRINTER'S INK

ANON. The trend to fine-screen printing. Modern Packaging 26, no. 10: 99-104 (June, 1953).

Packaging printers had to meet the problem of reproducing illustrations which appeared on the smooth surface of magazine stock onto the rough surface of boxboard without losing any of the color necessary for eye and appetite appeal. The three types of methods used for package printing (letterpress, offset lithography, and gravure) have made much progress toward mass-produced, fine-screen, full-color-process reproductions on boxboard; examples of each process are given. 14 illustrations. R.A.S.

SCHWARZ, RALPH H. Printing plates for today's production demands. Tappi 36, no. 6: 157-9A; discussion: 159A (June, 1953).

The author discusses new methods and production aids in printing platemaking for paper- and board-converting production, with particular reference to the manufacture of rotary-press printing plates. E.S.

SIMMONS, R. H. Developments in the graphic arts—1952. Tappi 36, no. 6: 160-9A (June, 1953); *cf.* B.I.P.C. 22: 687.

Developments in the graphic arts during 1952 are reviewed under the head-

ings: paper, printing inks and supplies, ink making materials, ink drying, offset process, platemaking, aniline printing, silk screen, color, photographic, bindery, and testing instruments. The references are included in the body of the article and not listed in a special bibliography at the end. E.S.

VAN DERVEER, ROBERT T. Paper problems of the rotogravure printer. Tappi 36, no. 5: 190-2A (May, 1953).

The author discusses some of the important paper problems which exert a decisive influence on the results obtained in gravure magazine and newspaper-supplement printing. The most important physical attributes of gravure paper are smoothness, compressibility, and compressibility ratio; in addition, brightness, color, opacity, and gloss affect gravure in the same manner as offset and letterpress printing. A printing defect called moiré resulting from a pattern in the paper, the harmful presence of sulfur and abrasive particles in paper, and mechanical roll defects (atmospheric or built-in wrinkles, slack or tight centers and ends, starred rolls, slime holes, and improperly made or unflagged splices), and their influence and possible avoidance are also considered. E.S.

RESEARCH

DEMMON, E. L. Forest research and its relation to the wood-using industries in the Southeast. J. Forest Products Research Soc. 3, no. 2: 10-12, 85 (June, 1953).

Among current and anticipated research problems in the Southeast are: the search for uses for low-grade hardwoods, the development and growing of new and better kinds of trees, and the study of effects of forestry practices on water supply. There is promise that lower-grade hardwoods will be the basis for new industries in the future. 3 illustrations. E.S.

HINMAN, JOHN H. A report to stockholders of International Paper Company. Southern Pulp Paper Mfr. 16, no. 6: 74-6 (June, 1953); Tappi 36, no. 6: 121-3A (June, 1953).

Excerpts from the 1952 annual report are given, with particular reference to the company's research activities and laboratories at Hawkesbury, Glens Falls, and Mobile, and to forest research, notably in Canada. E.S.

NOLAN, W. J. Pulp and paper research at the University of Florida. Paper Ind. 35, no. 2: 185-7 (May, 1953).

The author reviews researches carried out since 1946 in the Pulp and Paper Laboratory of the Chemical Engineering Department of the university's College of Engineering, including the utilization of scrub oak, bark separation from hardwoods, continuous alkaline pulping, the development of a sulfate process for the production of dissolving-grade pulps, a continuous semi-chemical process, bleaching of high-consistency stock, etc. E.S.

RESEARCH LABORATORIES

ANON. Mead dedicates $1 million lab. Paper Trade J. 136, no. 19: 13-14 (May 8, 1953); Paper Mill News 76, no. 19: 5 (May 9, 1953); Paper Ind. 35, no. 3: 307-8 (June, 1953); Tappi 36, no. 6: 110A, 112A, 114A (June, 1953); Chemurgic Dig. 12, no. 5: 15 (May, 1953).

A brief description of the new research laboratories of the Mead Corp. at Chillicothe, Ohio is given; they comprise a two-story office and laboratory building, including the library, and a pilot-plant building which houses the

heavier experimental equipment. 1 figure in the first, 8 figures in the third, and 6 figures in the fourth reference. E.S.

ANON. Swedish F.P.L. Tappi 36, no. 6: 102A, 104A (June, 1953).

The Swedish Forest Products Research Laboratory for fundamental as well as applied research into all fields of wood chemistry and wood technology is described briefly. E.S.

ROOFING FELTS

ANON. New felt machine at Bird Phillipsdale mill. Paper Trade J. 136, no. 19: 24-5 (May 8, 1953).

A brief description of the new cylinder machine in the Bird & Son, inc. plant at Phillipsdale, R.I. is given; it includes a Goldsmith Stream-Flow vat built by the Pusey & Jones Corp. and a General Electric steam-turbine drive. The machine has a maximum speed of 300 f.p.m. and will average 150 f.p.m. The average daily production is about 50 tons of floor covering or roofing felt. 2 illustrations. E.S.

SAFETY

BENNETT, W. L. How our employees are protected in Quebec. Pulp Paper Mag. Can. 54, no. 6: 274, 276, 281 (May, 1953).

A review of progress in accident prevention methods in Quebec from their initiation in 1909 to the present day is given. R.A.S.

CHANT, DOUGLAS. Accident prevention our business. Pulp Paper Mag. Can. 54, no. 6: 281, 283, 285-7 (May, 1953).

The secretary of the Ontario Pulp & Paper Makers' Safety Association (organized after the Workmen's Compensation Act of Ontario in 1915) describes the plan for collecting and distributing compensation, work to remove hazards, use of protective devices, and hopes for future accomplishments. R.A.S.

SALESMEN AND SALESMANSHIP

ANON. A survey: the hiring of salesmen. Paper Sales 13, no. 6: 15, 39-42 (June, 1953).

This article gives the results of a survey conducted to find out from paper jobbers their methods of applicant selection, the hiring of salesmen from competitors, the nature of sales-training programs, and payment given in training periods. R.A.S.

SEMI-CHEMICAL PULPING PROCESS

EVANS, JOHN C. W. How Westvaco makes semi-chemical pulp at Mechanicville. Paper Trade J. 136, no. 18: 14-18 (May 1, 1953).

The operations in the new neutral sulfite semichemical pulp mill of the West Virginia Pulp and Paper Co. at Mechanicville, N.Y. are described. The process is designed to produce bleached semichemical pulp from local hardwoods, particularly birch, beech, and maple, for the book, writing, and other fine papers manufactured at this mill. The new plant replaces a soda pulp mill which has ceased operation. Details of wood handling, cooking in three rotary globe digesters, refining in Sprout-Waldron disk refiners, washing in an Impco brown stock washer, screening, and typical three-stage bleaching (chlorination, caustic extraction, and hypochlorite) are given. 1 flowsheet and 8 illustrations of the equipment. E.S.

HAYWOOD, GERALD, MARTENY, W. W., and TEXTOR, C. K. [Subcommittee on Terminology] Tappi 36, no. 6: 135-6A (June, 1953).

A condensation of comments on the terminology in semichemical pulping received from men or organizations active in the field are presented as suggestions rather than as final recommendations. E.S.

MCGOVERN, J. N., and CONVERSE, C. W. Semichemical Pulping Committee. Tappi 36, no. 6: 133-5A (June, 1953).

A report of the annual meeting (Feb. 17, 1953), including the reports of the different subcommittees, is presented. E.S.

SHERMAN, ED. West Virginia operates N.S.S.C. plant. Paper Mill News 76, no. 18: 6 (May 2, 1953).

A brief reference is made to the operations involved in the neutral sulfite semichemical plant of the West Virginia Pulp and Paper Co. at Mechanicville, N.Y. 1 flowsheet. E.S.

SHIPPING CONTAINERS

ANON. New paperboard-veneer container produced by Weyerhaeuser. Paper Trade J. 136, no. 19: 26 (May 8, 1953); Packaging Parade 21, no. 245: 84 (June, 1953).

Ply-Veneer is a three-ply material made by sandwiching one sheet of specially processed fir veneer between two sheets of kraft containerboard. The product is made by a section of the plywood plant of the Lumber Division of the Weyerhaeuser Timber Co., Springfield, Ore. The material is being introduced as a container material, although other uses are foreseen. Cartons made from Ply-Veneer combine exceptional ruggedness with light weight and long life; some types are made with end cleats and steel straps inserted under the outer layer of containerboard to provide a nailing surface, whereas the ordinary types are fastened by taping, banding, or stapling. 3 illustrations. E.S.

SPECIFICATIONS

BALKEMA, E. H. Quality control from a buyer's viewpoint. Tappi 36, no. 6: 154-7A (June, 1953).

The author emphasizes the need for a systematic quality control through co-operation between the carton supplier and user made possible through the establishment of standards on a national basis. The purchasing specifications of interest to producers of packaging materials of the Colgate-Palmolive-Peet Co. and the company's own quality control system are described. About 90% of the mistakes are detected in this system; typical errors include: make-ready sheets made into cartons, wrong color used in printing, incomplete die cutting of carton flaps, side seams of cartons with too much or insufficient glue, weak back liner causing carton splitting on production equipment, and off-caliper and -weight board. E.S.

STAINS AND STAINING

BOGER, GEORGE K., JR. An aid in fiber microscopy; the Du Pont Fiber Identification Stain A. Paper Trade J. 136, no. 14: 21-2 (April 3, 1953); Paper-Maker (London) 125: 55-6 (Mid-Summer, 1953).

Possible applications of Stain A (a mixture of dyes) to the qualitative identification of sizing agents, as an aid in spot and speck analysis, and for the determination of the beating degree of pulps are described. The need for greater interests in the general field of pulp and paper microtechniques is emphasized. E.S.

STARCH

MEYER, KURT H., and MENZI, ROBERT. Research on starch. 53. The fine structure of the starch granule. Helv. Chim. Acta 36, no. 3: 702-8 (April 30, 1953). [In French; English summary]

The fine structure of potato and maize starch granules has been studied. The action of heat on the swelling of the granules has been examined. Treatment at temperatures up to 150°C. diminishes the swelling in water, although there is an increase in dextrinization. This phenomenon is attributed to a growth of small crystallites at the expense of the free molecular segments, on the presence of which the swelling depends. The granules become entirely soluble at 170°. The crystallites of the granules contain amylopectin as well as amylose; this fact suggests the possible existence of mixed crystals. It has been confirmed that the "membrane" of the outer layer of the granules contains mainly amylopectin. 1 table, 2 figures, and 17 footnotes. E.S.

STATISTICAL METHODS

HARRINGTON, EDWIN C., JR. Increasing the efficiency and economy of experimentation. Tappi 36, no. 5: 137-40A (May, 1953).

The classical experimental design, in which the effect of one variable is investigated while the remaining variables are held constant, is expanded into factorial arrangements to consider several variables simultaneously. Factorial designs can provide much more information from the same amount of experimentation, with only a small loss in the precision of the classical methods. In addition, measures of the interdependence of variables or "interactions" are obtained. The techniques of partial replication and "confounding" are illustrated as two of the ways in which the experimental work required by the complete factorial design may be reduced to fit the limits imposed by the nonavailability of manpower, equipment, or materials. 9 figures and 5 references. R.K.E.

RILEY, F. L. Application of multiple correlation methods in the pulp mill. Tappi 36, no. 5: 192-5A (May, 1953).

Omitting the mechanics of multiple correlation, the author indicates what information may be derived by using correlational techniques from data involving a paper-quality characteristic, the dependent variable, and three independent processing conditions. The effect of each independent variable upon the quality characteristic is illustrated as the influence of the other two variables is held constant. This information is of value when considering the degree to which each factor should be controlled to attain the desired quality level and the extent to which these factors contribute to the total variability of the dependent variable. 1 table, 7 figures, and 1 reference. R.K.E.

STEAM POWER

ANON. River Raisin power plant. Pulp & Paper 27, no. 6: 104, 106, 108, 113-14 (June, 1953); *cf.* B.I.P.C. 20: 521.

The new power plant of the River Raisin Paper Co. at Monroe, Mich. is described. 12 illustrations. E.S.

STEVENS, W. O. How power is produced at Port Alice. Paper Trade J. 36, no. 22: 22-3 (May 29, 1953).

The new high-pressure, by-product-power plant at Port Alice, B.C. (now owned by Alaska Pine & Cellulose Ltd.) is described. Two new high-pressure boilers and two Elliott back-pressure turbine generators will replace 13 old boilers and three condensing turbine generators. The design of the new powerhouse is complicated by the fact that construction must proceed without interfering with mill production. In addition, a new bleach plant, woodroom, and water-supply system are being built. 2 illustrations. E.S.

STRAW

WELLS, SIDNEY D., and BROWNING, BERTIE L. The chemical composition of the internodes and nodes of soft wheat straw. Tappi 36, no. 6: 170A (June, 1953).

In some recent work on the pulping of soft wheat straw (typical of that used by the strawboard mills of the Central States) the question arose as to the chemical composition of the fibrous residues derived from the nodes as compared with the internodes as a basis for evaluating the merits of removing the softened nodes before processing the straw to pulp for papermaking. Separate chemical analyses of the two fractions from two straw samples are presented in which the internodes amounted to an average of 8.6% and the nodes to 91.4%. The results of the present study indicate that a pulp containing less than 10% of internodes in the furnish can be used without affecting the over-all properties; stream pollution caused by the discharge of the screenings and loss of paper stock to the mill are thereby avoided. 3 tables and 2 figures. E.S.

STREAM POLLUTION

ANON. P. H. Glatfelter waste treatment plant. Paper Mill News 76, no. 18: 9 (May 2, 1953).

A very brief description of the plant which treats the combined wastes from Glatfelter's pulp mill and bleach plant, deinking plant, and paper mill is given. It involves combination settling and gravel-bank filtration basins used in series and a Hardinge clarifier from which the effluent is discharged into the Codorus Creek (*cf.* B.I.P.C. 20: 44-5; 21: 496). E.S.

ANON. Problem of de-ink waste. Pulp & Paper 27, no. 6: 34-6 (June, 1953); *cf.* B.I.P.C. 23: 15.

The problem of (preferably profitable) sludge disposal by the six deinking mills of the Kalamazoo River Valley, possibilities, and progress made to date are discussed. 1 table, 1 flowsheet, and 2 illustrations. E.S.

ANON. The Sediflotor. Paper Mill News 76, no. 18: 10 (May 2, 1953).

The Sediflotor (made by Infilco Inc.) is a rapid-rate clarification unit which utilizes the principle of flotation by dissolved air; its construction and mode of operation are described briefly. 1 diagram. E.S.

HEUKELEKIAN, H., *and others.* A critical review of the literature of 1952 on sewage, waste treatment, and water pollution. Sewage Ind. Wastes 25, no. 5: 511-47; no. 6: 633-83 (May, June, 1953); *cf.* B.I.P.C. 22: 774.

The first section of this extensive review deals with analytical methods, sewage, and radioactivity. The second section covers industrial wastes, including pulp and paper (p. 646-9) and water pollution, which is subdivided into chemistry, bacteriology, biology, B.O.D. and oxygen sag, stream surveys and studies, and abatement and control. 634 references. R.A.S.

VAN HORN, WILLIS M. Progress in stream improvement. Part 3. Problems resulting from paper mill wastes and the measurement of stream quality. Paper Ind. 35, no. 3: 331-3 (June, 1953); *cf.* B.I.P.C. 23: 671.

The author reviews recent developments in white-water disposal and methods for measuring stream quality. The problem of toxicity in the pulp and paper industry is not as great as it is in some other industries. The two major problems facing the industry are the maintenance of an adequate oxygen balance in the receiving water and the reduction to a practical minimum of the loss of inert solids. 1 figure and 45 references. E.S.

SULFITE PROCESS

ANDERSON, C. H. Sulphur usage and distribution in sulphite pulping. Tappi 36, no. 11: 255-60 (June, 1953).

Sulfur balances were made on calcium bisulfite western-hemlock experimental cooks. Sulfur consumption and distribution were computed, and their relation to pulp yield is illustrated graphically. Sulfur consumption, defined as total sulfur in spent cooking liquor flashed at 5 p.s.i., plus sulfur left in the digester after draining the spent liquor, plus unaccounted-for sulfur, decreased from about 265 to 170 lb./air-dry ton of screened pulp, as the yield was increased from 40 to 50%. Stripping of flashed spent liquor showed potential additional savings of only 10 to 20 lb. of sulfur/ton, which probably would not justify the operation. Recycling of relief-liquor solids had little or no effect on sulfur usage or distribution. In the range of 140 to 148°C., cooking temperature had no appreciable effect on sulfur usage, but altered the distribution of recovered sulfur dioxide between gas relief and gases flashed from spent liquor. The sulfur usages presented here can be considered limiting values which might be realized commercially if suitable equipment and procedures were employed. 4 tables, 6 figures, and 7 references. E.S.

SULFITE WASTE LIQUOR

ANON. Review of Marathon's Chemical Division. Paper Mill News 76, no. 18: 15-16 (May 2, 1953); *cf.* B.I.P.C. 23: 672.

The development of the Howard process for handling spent sulfite liquor, the research carried out at Marathon, and the present status and work of the Chemical Division are reviewed, with particular emphasis on the historical side of its growth. E.S.

DARMSTADT, W. J., and RICHTER, F. H. Some economic aspects of burning sulphite waste liquor. Tappi 36, no. 6: 171-4A (June, 1953).

With the development of suitable evaporators, the concentration of spent sulfite liquor is now practical, and disposal may be accomplished by burning with recovery of the heat value of the liquor. Under proper conditions a considerable reduction in the amount of fuel purchased by the mill will result, and these fuel savings are available to offset the capital and operating costs of the disposal system. The fuel savings depend on the amount of fuel saved and

the local price of commercial fuel. Chemical recovery, in addition to heat recovery, will reduce the chemical costs and increase the possible savings from burning. The authors discuss some of the economic factors bearing on heat and chemical recovery and describe some of the problems incident to the burning operation. Since considerable investment in equipment will be required to collect, evaporate, and burn the liquor, the savings in fuel and chemical must be evaluated against the investment and increased operating costs to determine the over-all economics of disposal by burning. Conditions will vary from mill to mill, and an economic study should be made by each plant before deciding on liquor disposal by burning. The unit cost of equipment and operation will decrease with increasing capacity or mill size; partial disposal of liquor will require less expensive installations than complete disposal. 1 diagram and 3 references. E.S.

SULFITE WASTE LIQUOR—AMMONIA BASE

MARTIN, J. B. The utilization of ammonia-base sulphite liquor. Tappi 36, no. 6: 175-6A (June, 1953); Proc. Fourth Ann. Ind. Waste Conf. State Coll. of Washington: 50-2; discussion: 52 (1952).

Orzan is the trade name of ammonia-base spent sulfite liquor made available as a solution or in powdered form by the Industrial Products Division of the Crown Zellerbach Corp. The commercial utilization of Orzan (50-60% ammonium lignosulfonates, 25-30% sugars, and 3.5% nitrogen) includes, in addition to the common uses of spent sulfite liquor, a number of applications which are in part or entirely dependent upon the presence of the ammonium ions. The principal among these is its use in agriculture for soil improvement. When used as a dispersant or tanning agent the absence of calcium ions is a decided advantage. Under the influence of elevated temperatures, the ammonia, lignosulfonates, and sugars condense to large molecular structures with increasing insolubility of the ingredients in water, although they will swell and soften. Heat-treated Orzan powders may find use in plugging porous strata during oil-well drilling, as conditioners for mixed fertilizers to prevent caking, or as a direct additive to certain soils to loosen them and improve water retention, etc. E.S.

TALL OIL

WHEELER, D. H., FOSTER, R. J., and BERRY, A. P. Fractionation of tall oil. Am. Paint J. 37, no. 24: 62-6 (March 2, 1953).

The composition of tall oil and some methods of separating fatty acids and rosin acids are briefly reviewed. Continuous fractional vacuum distillation has been proved to be the most economical large-scale method now used. The fatty acid fraction can be produced with less than 2% rosin acids. It is a liquid acid, low in saturates and consists of about equal amounts of oleic and linoleic acids, with no linolenic acid. It is useful in nonyellowing alkyds, paste and liquid soaps, and emulsifying agents, and for chemical derivatives. The rosin fraction is usually produced to contain about 70% rosin acids and 25% fatty acids. The rosin acids in this fraction are similar to those of wood rosin. The fatty acids in the rosin are rich in linoleic acid (63%), including 22% of conjugated linoleate. When esterified, as in a maleic-pentaerythritol-rosin ester resin, these fatty acids form 25% of an excellent drying oil which replaces a corresponding amount of oil in the final varnish. 4 tables, 2 figures, and 20 references. E.S.

TARIFF

GRAHAM, MORTIMER. Tariffs and international trade; the position of the pulp and paper industry. Southern Pulp Paper Mfr. 16, no. 6: 72-4 (June, 1953).

A summary of the policy on tariffs of the American Paper and Pulp Association is presented. The need for the establishment of a tariff policy by Congress under the Constitution is emphasized, and some of the harmful results of the absence of such a policy, based upon the paper industry's experience, are recorded. E.S.

TRADE-UNIONS

JORDAN, CHESTER. The development of labour relations. Pulp Paper Mag. Can. 54, no. 6: 160-2 (May, 1953).

The history of labor relations in the Canadian pulp and paper industry since 1900 is traced. 1 illustration. R.A.S.

VANILLIN

JAYNE, JACK E. The syntheses of 5- and 6-chloroacetovanillone. J. Am. Chem. Soc. 75, no. 7: 1742-3 (April 5, 1953).

In connection with a study of lignin, the diazomethane (I) method for the synthesis of acetophenones from benzaldehyde was used for synthesizing 5- and 6-chloroacetovanillone. (I) was reacted with 6-chlorovanillin acetate to yield the β-hydroxy ketone (II) which was dehydrated to the diacetate of the chalcone by means of acetic anhydride in pyridine. Complete hydrolysis of (II) yielded 6-chlorovanillin and 6-chloroacetovanillone. 5-Chloroacetovanillone was obtained similarly. The intermediates and final products were fully characterized. 9 footnotes. R.C.R.

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XXI. Amides of vanillic and 3-ethoxy-4-hydroxybenzoic acids. J. Am. Chem. Soc. 75, no. 11: 2627-30 (June 5, 1953); *cf.* B.I.P.C. 23: 131.

Nitrogen-substituted amides of vanillic acid and 3-ethoxy-4-hydroxybenzoic acid were prepared by condensing the O-carbethoxy chlorides of these acids with the appropriate amines and selectively hydrolyzing the O-carbethoxy group of the resulting O-carbethoxyamides. The compounds were tested for activity against *Bacillus mycoides* and a large number of pathogenic bacteria and fungi. In general, the activity was poor and, unlike the esters of these acids, the substituted amides of vanillic acid exhibited greater activity than did the corresponding amides of 3-ethoxy-4-hydroxybenzoic acid. 2 tables and 13 footnotes. E.S.

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XXII. Ethers of protocatechuic acid and their ethyl esters. J. Am. Chem. Soc. 75, no. 11: 2630-3 (June 5, 1953).

Vanillin was demethylated to protocatechualdehyde by means of anhydrous aluminum bromide, and the aldehyde was alkylated to several of its mono- and dialkyl ethers by reaction with alkyl halide in the presence of alkali or alkali carbonate. The alkyl ethers of protocatechualdehyde were oxidized to their respective acids with one mole of silver oxide in the presence of excess aqueous alkali. Ethyl esters of these acids were prepared by reaction with anhydrous ethanol in the presence of concentrated sulfuric acid. The sulfuric acid was removed by means of anion-exchange resin. Inhibiting concentrations of these esters toward *Bacillus mycoides* indicated a slight increase in activity with increasing chain length in the ether group, but no effect caused by change in position of the ether group. 2 tables and 19 footnotes. E.S.

VISCOSITY

BERGEN, J. T., and PATTERSON, W., JR. Anomalous viscous flow at very low rate of shear and small shearing stress. J. Appl. Phys. 24, no. 6: 712-19 (June, 1953).

A translational concentric cylinder viscometer of the Pochettino type is described, for which an analytical balance is employed to achieve very small shearing stress and an electrical transducer to observe low rate of shear. The ultimate sensitivity of such a device is found to be 5×10^{-3} dyne/sq. cm. maximum shear stress and 1×10^{-4} sec.$^{-1}$ maximum shear rate. Calibration with Newtonian liquids of known viscosity agrees with a theoretical expression for viscosity, allowing for "end" effects. The flow properties of various complex, anomalous systems are described for the region very near the shear rate-shear stress origin. With the exception of a high-solids latex suspension, which was Newtonian, the complex systems exhibited a yield value and anomalous flow in the post-yield region. The yield values of several household paints for very small rates of shear are found to correlate with their leveling and sagging properties, except where thixotropic effects become large in terms of the time required for leveling to occur. The yield values thus observed are considerably less than those reported elsewhere and do not exceed about 6 dynes/sq. cm. Industrial organosol coatings are found to possess similar characteristics. Examples are given of the effect of addition of a "flow-out" agent and of the effect of aging upon such materials. 1 table, 8 figures, and 20 references. E.S.

BESTUL, A. B., and BELCHER, H. V. Temperature coefficients of non-Newtonian viscosity at fixed shearing stress and at fixed rate of shear. J. Appl. Phys. 24, no. 6: 696-702 (June, 1953).

Viscosity decreases with increasing shearing stress or rate of shear in the non-Newtonian flow of high polymeric systems. It is shown that it follows from this fact that the variation of viscosity with temperature is greater at fixed shearing stress than at fixed rate of shear. For such systems, it is shown experimentally that the variation of viscosity with temperature at fixed shearing stress is independent of shearing stress. However, the variation at fixed rate of shear is always less than that at very low shearing stress, and decreases with increasing rate of shear. This behavior is reproduced by Eyring's hyperbolic sine flow equation, which is the antecedent for most other, more adequate, non-Newtonian flow equations. However, this equation is shown to be inadequate in that it predicts incorrect values of shearing stress for the occurrence of non-Newtonian behavior. 5 tables, 4 diagrams, and 11 references. E.S.

WASTE HEAT

JUNKER, O. Heat economies effected in pulp manufacture; some Swedish experiences. Assoc. tech. ind. papetière, Bull. no. 3: 74-82 (1953). [In French]

The author reviews some Swedish methods and installations for heat recovery in sulfate and sulfite mills, bleaching, drying of paper, and burning of liquor. 17 figures. L.E.W.

WASTE PAPER

ANON. How Consolidated W.P.&P. Co. handles wastepaper. Fibre Containers 38, no. 5: 86 (May, 1953).

Experiments for finding the most efficient and economic methods of han-

dling and storing waste paper showed that the standard 72-inch bales, mechanized equipment (preferably three-ton power units), and permanent storage shelters with partial side wall, concrete floor, and open sides and ends to permit circulation of air are the most desirable. 4 illustrations. E.S.

MADSEN, F. Modern method of preparing, cleaning and treating waste paper for paper and paperboard use. Svensk Papperstidn. 56, no. 9: 338-50 (May 15, 1953). [In English]

The author reviews recent developments in the regeneration of waste paper. He emphasizes the fact that it is preferable to separate as much of the dirt from the usable fibers as possible before their treatment in refiners or other stock-preparation equipment. Otherwise, a considerable amount of power is required to brush out the dirt in the refiners, with a resulting overtreatment of the acceptable fibers. The majority of waste paper used in paper and board mills consists of mixed dirty waste containing all types of junk and refuse (in England called Grade 13). The impurities are of two types: those having a specific gravity higher than water and those having a specific gravity the same or less than water. The slushing and cleaning system for mixed waste papers involves the following steps: disintegration and slushing of waste-paper bales (Hydrapulper); removal of large heavy particles (junk remover or junk box); removal of large stringy impurities, such as rags, ropes, and wires (ragger); removal of high-gravity dirt, such as paper clips, sand, small pebbles, stones, etc. (centrifugal screen); removal of floating trash, such as matches, corks, rubber bands, wet-strength papers, and cellophane (Classifiner); recovery of usable fibers in the Classifiner rejects (Disintegrator and Selectrap or flat screen); and concentration and thickening of accepted fibers (thickeners). The construction and applications of the different types of machinery are described. 1 table, 1 flowsheet, 23 figures, and 4 references. E.S.

WAXES

SIMERL, L. E. Waxes in protective packaging. Food Technol. 7, no. 6: 256-7 (June, 1953).

The present status of waxes and wax additives in food packaging is reviewed. Recent developments include the use of such materials as polyethylene, polyisobutylene, and other synthetic resins, and a variety of additives for specialized purposes in an attempt to obtain increased gloss, heat-seal properties, and viscosity, decreased scuffing, and other advantages. 2 tables and 8 references. R.A.S.

WET STRENGTH

BOUGHTON, FRED W., and MACKENZIE, K. J. Use of aluminum chloride in melamine-treated papers. Tappi 36, no. 11: 268-70 (June, 1953).

The use of melamine resin for preparing high wet-strength papers has gained general recognition in the trade. The advantages of using aluminum chloride in the place of aluminum sulfate for precipitating the beater size when using melamine resin has not been adequately presented in the technical literature. Although the price of aluminum chloride is several times greater than that of alum, a considerable saving in paper manufacturing costs may be realized. This is accomplished by a drastic reduction in the melamine-resin furnish without any sacrifice in wet strength. Data represented by actual machine production showing the advantages of aluminum chloride with melamine resin-treated paper are given. The results of these machine data cover beater furnishes with high α-cellulose and bleached rag stock. The use

of aluminum chloride in melamine-treated papers is covered by U. S. patent 2,548,513, granted to Boughton on April 10, 1951 (*cf.* B.I.P.C. 21:678). 6 tables, 2 figures, and 6 references. E.S.

WOOD

HERITAGE, CLARK C. The role of wood in industry. Paper Ind. 35, no. 3: 341-2 (June, 1953). [Abridgment]

The author reviews the three basic types of wood consumption: its use as a structural entity (lumber or plywood), its use as fiber (pulp, paper, board, or converted products), and its use as a chemical (products obtained by extraction, cleavage, and fractionation, utilization of by-products, etc.). Recent developments and the many problems still awaiting a satisfactory solution are mentioned. E.S.

WOOD—CHEMISTRY

MCCARTHY, J. L., and HERITAGE, C. C. What is wood as a chemical raw material? Pulp Paper Mag. Can. 54, no. 6: 189-92 (May, 1953).

The authors outline possible avenues to a better knowledge of the chemical constitution of wood and emphasize the need for such investigations, particularly in view of a more complete utilization of this raw material. 1 table and 4 references. E.S.

WOOD—DECAY

LINDGREN, RALPH M. Deterioration losses in stored southern pine pulpwood. Tappi 36, no. 11: 260-4 (June, 1953).

Losses in specific gravity of rough pine pulpwood after two, four, and six months of summer storage (April 15 to Oct. 15) in the deep South ranged between 2 to 4, 6 to 8, and 8 to 10%, respectively. For corresponding periods of winter storage, the losses were 0+ to 1.5, 1.5 to 3, and 3 to 5%. Peeled wood deteriorated most rapidly during the first several months of storage, regardless of season. Losses often exceeded those in rough wood for two to three months; with longer storage, they were progressively lower than in rough wood. Pulping trials by the U. S. Forest Products Laboratory showed little change in chemical composition of the wood during storage. Reductions in pulp yields on a wood-volume basis were proportional to losses in specific gravity during storage. Measurable effects on sulfate-pulp strength were indicated for pulpwood stored longer than two months in summer and five months in winter. The principal effect on groundwood pulp was a decrease in brightness. Contributing factors to low storage losses were: for rough wood—winter storage, large bolt diameter, long bolt length, tight piling, and fungicidal treatment of bolt ends; for peeled wood—quick peeling, open piling, small bolt diameter, splitting of large bolts, winter storage, and fungicidal treatment of entire bolt. 1 table and 7 references. E.S.

WOOD WASTE

JENKINS, J. H. The utilization of wood waste in Eastern Canada. J. Forest Products Research Soc. 3, no. 2: 7-9 (June, 1953).

Uses found for much of the wood waste in Eastern Canada are discussed. The trend toward integrated logging is causing such unnecessary wastes as high stumps, long-butts, including felled trees left on the ground, sound wood left in uncut defective trees, and wood left in large tops to disappear. Of the unavoidable wastes caused in the sawmill, sawdust is used for fuel or sold for

packaging material, and slabs, edgings, and trim are converted to by-products, sold for fuel wood, or utilized as pulpwood. 1 table. R.A.S.

JOSEPHSON, H. R. Wood pulp from woods and mill residues. Paper Ind. 35, no. 2: 179-80 (May, 1953).

A comparison of regional practices in the United States shows that 84% of the annual pulpwood cut in the South, 70% in the West, and 95% in the Northeast and Lake States regions comes from growing stock. The possibilities and opportunities for an increased use of logging, sawmill, and hardwood mill residues are discussed, with particular reference to new developments in equipment (barkers and chippers) and techniques in handling and shipping. 3 charts and 2 references. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

GAVER, KENNETH M., LASURE, ESTHER P., and THOMAS, LEVI M. Preparation of 2-alkali carbohydric derivative utilizing azeotropic distillation. U. S. patent 2,602,084. Filed Jan. 29, 1951. Issued July 1, 1952. 15 claims. Assigned to The Ohio State University Research Foundation. [Cl. 260-233.3] Canadian patent 492,469. Filed June 28, 1952. Issued April 28, 1953. 15 claims. Assigned to The Ohio State University Research Foundation.

Glucopyranose polymers, including starches, dextrins, simple glucosides, hexosans, and the like, are reacted with an alkali metal hydroxide in the presence of any solvent which forms an azeotropic mixture with water and boils in the desired range. The solvent is preferably nonaqueous, since the presence of even a little water is extremely deleterious. Any temperature from 80 to about 115°C. is satisfactory. These products are useful in sizing operations, as adhesives, and as intermediates in the formation of plastics. 2 figures. W.B.W.

KVALNES, HAMLINE M. Viscous urea-formaldehyde compositions and method for preparing the same. U. S. patent 2,625,524. Filed Dec. 26, 1951. Issued Jan. 13, 1953. 4 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 260-29.4]

A partially polymerized urea-formaldehyde resin is useful as a bonding resin in making sawdust board and in certain finished textiles. In an example, 1000 grams of "Arboneeld" B, a liquid urea-formaldehyde composition, are adjusted to pH 8 with 4% sodium hydroxide. Then 185 grams of urea are added to form a formaldehyde to urea mole ratio of 2.5. The mixture is heated to 100°C., 0.5% hydrochloric acid is added to pH 5, and heating is continued 130 minutes. Sodium hydroxide is added, the product cooled to room temperature, and the pH adjusted to 8. The concentration of the combined urea

and formaldehyde plus free formaldehyde is 69%, and the viscosity 130 centipoises. On storage at room temperature for four months, the viscosity increases to 235 centipoises, and the product remains clear. W.B.W.

MARTONE, THOMAS A., JR. Adhesive compositions, including an amylaceous material and a triazone. U. S. patent 2,641,584. Filed Oct. 26, 1951. Issued June 9, 1953. 6 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 260-17.3]

A starch-resin composition for use as an adhesive in the manufacture of corrugated board is claimed to have a pot life of at least 24 hours and yield a water-resistant film. The resin is formed (in a molar ratio of 1:3:6) by reacting diethylene triamine, urea, and formaldehyde at a temperature of 80 to 85°C. in aqueous solution adjusted with sodium carbonate to pH of 8.5 to 9. Upon cooling, four additional moles of formaldehyde are added; the material is in condition for use without any condensation and may be incorporated directly with the starch and aluminum sulfate (the preferred acid-reacting catalyst, although others may also be employed) into an adhesive composition. W.B.W.

TSCHABOLD, GOTTFRIED L., and MUELLER, DELBERT L. Adhesive from whey and a method of making it. U. S. patent 2,624,679. Filed April 26, 1951. Issued Jan. 6, 1953. 7 claims. [Cl. 106-139]

To make a liquid adhesive from waste whey for laminating paper sheets, gluing paper tubes, and similar uses, the whey is first evaporated to about one fifth its original volume either under vacuum or at atmospheric pressure. The thick viscous liquid is then mixed with yellow dextrin in the proportion by weight of two parts of whey to one part of dextrin. The addition of small amounts of borax and caustic soda improve the product. W.B.W.

ADVERTISING

WATT, ERNEST R. Advertising card and card holder assembly. Canadian patent 492,760. Filed Sept. 22, 1950. Issued May 12, 1953. 7 claims.

A card holder with a metal backing, the four edges of which are bent to form a channel, is claimed. The card is inserted and held by the channel on all four edges and obviates the usual difficulties found with cardboard advertising signs, such as buckling and bending, especially when wet; larger sizes of cardboard than heretofore possible may be used. 7 figures. W.B.W.

ALKALINE PROCESSES

SLOMAN, ARTHUR R. Two-stage pulping process. U. S. patent 2,639,987. Filed June 15, 1948. Issued May 26, 1953. 1 claim. Assigned to Associated Pulp and Paper Mills Limited. [Cl. 92-13]

Pulping of eucalyptus wood is accomplished in two stages, with the consumption of less caustic and in the same amount of time as required for a single-stage cook. Black liquor used for the first stage should contain between 60 and 75% of the alkalinity required to neutralize the natural acidity of the wood in a single-stage cook. The liquor contains only 3 grams/liter of caustic when drained from the digester. White liquor is next added to the digester and the cooking schedule adjusted to give a pulp of the desired permanganate number. Black liquor from the second stage is re-used for the first stage of the succeeding cook. A saving of 2% in new caustic was made in the two-stage cook. The quantity of caustic necessary for the second stage has been

determined by a formula which takes into consideration such factors as liquor dilution and residual caustic after the first stage. The invention is applicable to both soda and sulfate pulping processes, but is particularly applicable to the former. 3 figures. W.B.W.

ZEEHUISEN, JACOB J. Production of textile fibers from bast fiber material by alkaline digestion. U. S. patent 2,639,988. Filed Dec. 12, 1945. Issued May 26, 1953. 7 claims. [Cl. 92-14]

Chemical retting in the form of an alkaline digestion may be used for the production of textile fiber from flax, hemp, ramie, jute, and the like. In general, the alkali concentration should be between 5 and 15%, and the scutched material subjected to boiling in alkali for 30 to 45 minutes. An organic solvent, such as methanol or acetone, is employed to remove the gummy or pectineous material, so that these fibers will not stick together. The solvent is removed from the fiber by evaporation. A bleaching operation using an oxidizing agent such as peroxide or hypochlorite may be employed after the digestion stage. W.B.W.

ALUMINUM

BRUUN, OTTO J. Cup-shaped foil capsule. U. S. patent 2,641,402. Filed Jan. 14, 1948. Issued June 9, 1953. 1 claim. [Cl. 229-4.5]

A cup-shaped unit is formed from a metal-foil (such as aluminum) blank with a pleated overlapping of the sides. To strengthen the side construction and make the pleats retain their shape, the container is next pressed between dies to impress corrugations into the sides. The corrugations are closely spaced, lock the pleats into place, and improve the appearance of the article. 3 figures. W.B.W.

BARKERS AND BARKING

MERRIFIELD, JOHN B. Bark-removing apparatus having log-rotating and log-advancing peeler heads. U. S. patent 2,641,289. Filed June 23, 1952. Issued June 9, 1953. 14 claims. Assigned two thirds to James B. Fuller. [Cl. 144-208]

Each peeler head in this device consists of angular abrasion bars roughly parallel to the axis of log travel. Speed of rotation of each head is slightly different with the result that the log is rotated and advanced and, at the same time, the bars of the peeler heads abrade the bark from the log. These heads are arranged in groups of three, the lower two supporting the log and advancing it forward through the machine. Logs from 3 to 18 inches in diameter may be debarked in from three to five seconds according to the claims. 16 figures. W.B.W.

WILSON, PRICE. Bark-removing cutter reciprocable over step-by-step rotatable log. U. S. patent 2,640,516. Filed April 16, 1951. Issued June 2, 1953. 10 claims. Assigned 50% to Linwood Manufacturing Co. [Cl. 144-208]

This machine embodies a rotating cutting head mounted above a carriage on which the log is positioned. The cutting head travels in a direction parallel to the long axis of the log and is adjustable for depth of cut. After a strip of bark has been removed, the log is shifted slightly and the cutting head debarks the adjoining strip, etc. 8 figures. W.B.W.

BOARD

SCOTT, WYLMER L. Process of making fiberboard from groundwood. U. S. patent 2,642,359. Filed Aug. 18, 1947. Issued June 16, 1953. 7 claims. Assigned to Armstrong Cork Company. [Cl. 92-1]

A method of grinding is described whereby the long axis of the wood bole is transverse to the axis of rotation of the grinding stone. The distribution of long, medium, and short fibers resulting from this process is claimed to represent a good ratio for the production of fiberboard, so that the addition of long-fibered material to achieve strength in the board is not necessary. Loblolly pine is mentioned as particularly suitable for this use, although other woods, singly or in combination, such as willow, cottonwood, aspen, longleaf pine, shortleaf pine, slash pine, hemlock, fir, and the like, may also be employed. A stone of 20 to 24 grit with a coarse pattern has been found to give good results. 6 figures. W.B.W.

SERRES, JEAN P. J. Process of agglomerating particles of wood and the product thereof. U. S. patent 2,638,421. Filed April 6, 1949. Issued May 12, 1953. 11 claims. [Cl. 106-163]

A method for the molding of panels or other objects from pulp, shavings, fibers, or certain vegetable fibers with sulfur-containing organic compounds is claimed. Thiophens and thiophenic oils, either pure or diluted in hydrocarbons, can be used. The wood or vegetable products may be mixed with the thiophens in either cold or hot condition, then pressed at 10 to 50 kg./sq. cm. for from 5 to 40 minutes at temperatures from 160 to 255°C. Maximum temperatures and pressures produce hard water-repellent articles, whereas lower temperatures and pressures result in less water-repellent characteristics. W.B.W.

WILSON, WINFRED E. Process for manufacturing composite board. U. S. patent 2,639,994. Filed July 26, 1948. Issued May 26, 1953. 1 claim. [Cl. 106-163]

A simple process for the production of composite board from such ligneous materials as wood shavings, coarse sander dust, or mechanically defibered wood is claimed. The moisture content of the ligneous material is adjusted to 15 to 30%, after which the moist material is sprayed with a dilute solution of an acid (from 0.5 to 2% by weight), such as hydrochloric or sulfuric. It is then placed in a conventional board mold and subjected to heat (275 to 350°F.) and pressure (50 p.s.i.) for 6 to 10 minutes. A stronger product is obtained if phenol is added either before, during, or after the molding procedure. W.B.W.

BOARD—SHEET FORMATION

STEELE, HARMON. Apparatus for fiber collection. U. S. patent 2,641,028. Filed July 6, 1948. Issued June 9, 1953. 1 claim. Assigned to Johns-Manville Corporation. [Cl. 19-156]

Fibers formed from molten glass, rock, slag, etc. are directed into a collection chamber by air streams, steam jet, or other means. The bottom wall of the collection chamber is an endless belt upon which the felted layer is formed. Jets inside the chamber cause a turbulence adjusted to result in the deposit of a layer of uniform thickness over the entire width of the belt. A suction box under the conveyor belt causes some compaction of the felted layer. 3 figures. W.B.W.

BOARD, INSULATING

CONOVER, JAMES H. Treatment of cellulosic pulps. U. S. patent 2,639,989. Filed April 25, 1946. Issued May 26, 1953. 7 claims. Assigned to United States Gypsum Company. [Cl. 92-21]

Fiberboard products formed from wood, bagasse, straw, or like materials are limited in the forming process by the degree of hydration of the fiber, because hydration results in slow drainage of water from the slurry. The addition of an alkaline earth hydroxide such as lime hydrate is claimed to cause rapid drainage of hydrated pulp; this permits the manufacture of dense board products from hydrated fiber in existing equipment. Water resistance is imparted to the product by the addition of a sizing agent consisting of pearl starch containing a paraffin wax emulsion. An increase in board densities from 16 pounds/cu. ft. for untreated fiber *vs.* 25 to 28 pounds/cu. ft. for the treated fiber with commensurate increases in strength is listed among the advantages of the process. W.B.W.

BOARD SPECIALTIES

BERENSON, HENRY J. Battery insulator tube manufacture. U. S. patent 2,639,647. Filed Feb. 23, 1949. Issued May 26, 1953. 23 claims. Assigned to National Paper Can & Tube Company. [Cl. 93-36.5]

A cardboard tube of proper length is cut from a longer section, an expansible mandril is inserted, and a series of operations performed on the blank. The bottom of the tube is crimped by a curling tool, and a rotating tool forms the expanded shoulder over the expansible mandril. Upon completion of the operation, the finished tube is removed from the mandril and ejected from the machine. 9 figures. W.B.W.

FOSTER, THOMAS W., SCHECK, LEONARD E., and BRADLEY, EARL L. Drive-in theater service tray. U. S. patent 2,640,589. Filed March 5, 1952. Issued June 2, 1953. 2 claims. Assigned to Container Corporation of America. [Cl. 206-72]

A compartmented tray of paperboard may be easily set up from the flat and locked into place; it holds beverage cups, ice cream cones, plates, and the like securely in the separate compartments. 3 figures. W.B.W.

HENNESSEY, RUSSELL J., and JAMESON, MORTON B. Partition pad. U. S. patent 2,640,644. Filed July 5, 1949. Issued June 2, 1953. 6 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-42]

A partition pad divides a rectangular container horizontally and is supported by a leg at each end adjacent to the carton wall and a center leg which is a folded section of the pad. Into the fold of the center leg is stitched a vertical board member of such size that it divides the carton vertically. 3 figures. W.B.W.

STRASSER, MYRON S. Collar protector and support. Canadian patent 492,757. Filed July 9, 1952. Issued May 12, 1953. 3 claims.

At each end of the support, the paperboard protector is creased in such a manner that the ends form a hinge at right angles to the remainder of the band. A small angular portion of the band is cut in such a fashion that it

turns with the hinge and forms a foot to give additional support when the band is in place. It is claimed that the hinged portion applies the load in an edgewise manner to the band and thus results in better crush resistance than other protectors. 7 figures. W.B.W.

CHLORINE DIOXIDE

AUDOYNAUD, MAX L. Manufacture of chlorine dioxide of low chlorine content. U. S. patent 2,641,528. Filed July 27, 1949. Issued June 9, 1953. 3 claims. Assigned to Mathieson Chemical Corporation. [Cl. 23-152]

The rate of reaction between a chlorate and a mineral acid, such as sulfuric acid, is claimed to be controlled by the rate of air flow through the mixture, so that very little chlorine is produced to contaminate the chlorine dioxide. In an example cited, 71.73 grams of sodium chlorate were placed in a column with 1500 cc. of sulfuric acid having a concentration of 1230 grams/liter. Air was blown through the column at the rate of 30 liters/hour. After 6.5 hours, 69.23 grams of chlorate had been converted and produced 30.23 grams of chlorine dioxide and 1.09 grams of chlorine. 1 figure. W.B.W.

COOKING PROCESS

DE BENNEVILLE, PETER L. Bis alkylbenzyl ethers of polyethylene glycols. U. S. patent 2,596,092. Filed March 28, 1950. Issued May 13, 1952. 11 claims. Assigned to Rohm & Haas Company. [Cl. 260-611; changed to 252-156]

Stable, nonionic, surface-active compounds are prepared by reacting together one mole of polyethylene glycol and at least two moles of alkylbenzyl halide (in which the alkyl group has 6 to 15 carbon atoms) in the presence of about two moles of an alkali metal hydroxide. Since these materials are very stable in the presence of strong alkali, kier boiling, pulp digestion, and mercerization are among the uses claimed. W.B.W.

DECULATOR PROCESS

CLARK, CARLETON L., and VICARIO, CARLO. De-aerating a suspension of cellulosic fibers. Canadian patent 493,250. Filed Aug. 25, 1949. Issued May 26, 1953. 3 claims. Assigned to The Rotareaed Corporation.

This is identical with U. S. patent 2,614,656 (Oct. 21, 1952); *cf.* B.I.P.C. 23: 214. 7 figures. W.B.W.

DISPENSING CONTAINERS

DUELL, EDITH B. Dispensing containers. Canadian patent 493,080. Filed June 6, 1950. Issued May 26, 1953. 3 claims.

A dispensing container incorporates a pocket at one end protected by a barrier member attached to the sliding lid. Sliding the lid into the open position allows one capsule to remain in the pocket and prevents other capsules from entering the pocket. Tolerances in box design are adjusted with respect to the capsule to be dispensed so that jamming is practically impossible. 4 figures. W.B.W.

SMITH, MABEL B. Disposable tissue dispenser and container. U. S. patent 2,640,587. Filed Oct. 4, 1948. Issued June 2, 1953. 2 claims. [Cl. 206-37]

A pocket package is claimed which will accommodate about a dozen disposable tissues. An hour glass-shaped opening in the top facilitates the removal of individual tissues and still retains the unused portion inside the cover. This cover may be carried in a man's pocket or a woman's handbag, or be built into the side of a handbag. 3 figures. W.B.W.

DYES AND DYEING

KELLER, ERNST, and ZWEIDLER, REINHARD. 4:4′diaminostilbene sulfonic derivatives. Canadian patent 492,998. Filed Oct. 18, 1948. Issued May 19, 1953. 5 claims. Assigned to J. R. Geigy A. G.

This optical brightening agent is formed by the condensation of 4,4′-nitroaminostilbene-2,2′-disulfonic acid with cyanuric chloride and concentrated ammonia. It is claimed to be especially suitable for wool, but may also be used with cellulose fibers, where 0.1 to 2% is required for brightening of pulp. The brightening effect is fast to water and light. W.B.W.

KELLER, ERNST, and ZWEIDLER, REINHARD. Stilbene sulfonic acid derivatives. Canadian patent 492,999. Filed July 13, 1949. Issued May 19, 1953. 4 claims. Assigned to J. R. Geigy A. G.

This is similar to Canadian patent 492,998. These compounds are optical brightening agents suitable for wool and cellulose fibers. They are slightly yellowish in aqueous solution and have a greenish fluorescence in daylight. W.B.W.

EVAPORATION AND EVAPORATORS

TOMLINSON, GEORGE H., and SWARTZ, JOSEPH N. Apparatus for concentrating residual pulp liquor by direct contact with flue gases. Canadian patent 493,131. Filed May 17, 1948. Issued May 26, 1953. 5 claims. Assigned to Canada Paper Co.

A cyclone evaporator is adapted for the concentration of kraft black liquor by direct contact with the flue gases resulting from the burning of the concentrated black liquor. This is the same as U. S. patent 2,590,905 (April 1, 1952); *cf.* B.I.P.C. *22*: 708. 10 figures. W.B.W.

FLOOR COVERING

MCBRIDE, EUGENE B. Floor covering and felt base material. U. S. patent 2,638,638. Filed April 4, 1950. Issued May 19, 1953. 4 claims. Assigned to Sloane-Blabon Corporation. [Cl. 20-7]

The object of this invention is to facilitate the removal of a material such as linoleum by a controlled splitting of the felt base. A barrier coat of material incompatible with asphaltic or bituminous saturants is applied prior to the saturation of the felt. Examples of such materials are cornstarch, glues, and resinous or rubberlike materials. The felt base is then saturated and the face material applied to the opposite side from that treated with the barrier coat. When the floor covering is removed, the felt base will fracture in the zone affected by the barrier coat, leaving only a thin layer of felt with the adhesive on the floor. The advantages of such a base include the possible re-use of the floor covering and the easy preparation of the surface for re-covering. 2 figures. W.B.W.

FOLDING BOXES

ANDERSON, WILBUR G., JR. Folding box. U. S. patent 2,639,080.

Filed Oct. 31, 1949. Issued May 19, 1953. 1 claim. Assigned to American Box Board Company. [Cl. 229-38]

A box is claimed which may be cut from a minimum of sheet material, is provided with ears for locking the carton in the closed position, and is easily folded from the flat blank into the finished box. 6 figures. W.B.W.

CLARK, JOHN D. Combined cover and handle structure for paperboard boxes. Canadian patent 493,198. Filed Oct. 24, 1950. Issued May 26, 1953. 3 claims. Assigned to The Hinde & Dauch Paper Company.

The end walls of this container are extended to form handles. A cover flap with a slit through which the handles protrude is locked in place with a tongue from the opposite side. In carrying position, the weight in the carton tends to hold the cover flap in alignment and lock it more rigidly in place. 3 figures. W.B.W.

FRANKENSTEIN, WILLIAM P. Display carton. U. S. patent 2,640,642. Filed Nov. 27, 1948. Issued June 2, 1953. 7 claims. [Cl. 229-16]

This display carton from a single blank may be shipped in knocked-down form and set up by the user. A saving in storage and shipping space is realized over the setup boxes normally used for this purpose. 12 figures. W.B.W.

GOLDSMITH, ALBERT J. Container structure with handle attachment. U. S. patent 2,639,082. Filed May 26, 1948. Issued May 19, 1953. 1 claim. [Cl. 229-52]

A container of relatively flat construction having telescoping end and top walls with attached handle is disclosed. The handle is made from such material as paper and tape and attached on the inside of the container. Slits provided in the inner and outer top flaps permit the passage of the handle to the outside for carrying. The construction entails a minimum of weakening of the carton structure. 8 figures. W.B.W.

PETTER, NOEL A. Multiple cell carton. U. S. patent 2,639,079. Filed April 28, 1950. Issued May 19, 1953. 8 claims. [Cl. 229-28]

This carton is of the type generally used for packaging eggs and is an improvement over U. S. patent 2,103,832 (Dec. 28, 1937). A stronger carton is provided with a substantial reduction of sheet material and a simplified folding and gluing procedure. The box assumes a convenient flat folded position for shipping purposes. 12 figures. W.B.W.

INTERIOR PACKING

AMBRETTE, LOUIS C., and MCNEIL, JOHN W. Shipping package for press inking rolls. U. S. patent 2,639,807. Filed Dec. 24, 1949. Issued May 26, 1953. 2 claims. [Cl. 206-65]

Paperboard or corrugated-board inserts are placed in each end of this shipping package to hold the rolls in a suspended position within the carton. The inserts are punched in such a manner that the shaft of the roll projects through, and a shoulder on the shaft positions the insert in the carton. 9 figures. W.B.W.

METZGER, HENRY L. Article holding insert for cartons. U. S. patent 2,639,081. Filed Oct. 6, 1949. Issued May 19, 1953. 1 claim. [Cl. 229-42]

The insert is designed to hold irregularly shaped articles (spoons, etc.) in position within a carton. It is scored adjacent to each aperture, so that upon bending the opening will receive the article; when returned to a normal-plane position, the article is locked in place. 6 figures. W.B.W.

MACHINERY—BOARD MACHINES

TEMPERLEY, JOHN. Wound board machines. Canadian patent 492,890. Filed May 31, 1950. Issued May 12, 1953. 5 claims. Assigned to Walmsleys (Bury) Limited.

A make-up roll with a toothed blade recessed in a groove will cut the sheet during rotation and at high linear velocity. After the desired thickness of a wet-lap board is built up on the roll, the blade is caused to extend from and retract into the groove by a manually operated air valve. A doctor blade actuated by a ram removes the board after the cutting blade is retracted into the make-up roll. 4 figures. W.B.W.

MACHINERY—CARTON-FEEDING MECHANISM

ANNESS, RUSSELL W. Timed feeding device for carton blanks. U. S. patent 2,639,916. Filed July 19, 1949. Issued May 26, 1953. 7 claims. Assigned to The Gardner Board and Carton Co. [Cl. 271-35]

Carton blanks or other sheet-like articles are stacked in a hopper, then fed in a timed sequence from the bottom of the stack as required by the assembly or other machines. The entire stack is lowered at the moment of feeding so that the leading edge of the bottom blank is contacted by rubber belts or other frictional devices and at the same moment, the trailing edge is contacted by a roll provided with a rubber or other frictional pad. In this manner the bottom blank is moved forward without misalignment. A retard element is set at the forward edge of the hopper to allow the exit of only the bottom sheet. 4 figures. W.B.W.

MACHINERY—CONVERTING MACHINERY

BAUMGARTNER, JOHN R. Blank forming press feed. U. S. patent 2,638,821. Filed July 12, 1950. Issued May 19, 1953. 5 claims. [Cl. 93-58]

The press-feeding mechanism consists of a pair of intermittently active feed rolls which, in turn, are supplied by a pair of continuously active metering feed rolls. A controlled loop is formed in the web between the two sets of rolls during the cutting operation of the press. 9 figures. W.B.W.

FAHEY, RICHARD J. Carton setup machine. U. S. patent 2,639,648. Filed Sept. 28, 1946. Issued May 26, 1953. 32 claims. Assigned to Shellmar Products Corporation. [Cl. 93-37]

A machine for setting up collapsed paperboard-type egg cartons at high speed utilizes a chute for formation of the carton body and discharges any carton which for any reason was not properly set up during passage through the machine. Throughout the operation, the carton is supported against displacement which is liable to cause damage. 16 figures. W.B.W.

GRAMEGNA, FRANCO. Bag bottom forming device. U. S. patent 2,641,167. Filed Oct. 9, 1950. Issued June 9, 1953. 11 claims. Assigned to St. Regis Paper Company. [Cl. 93-22]

This device embodies a conveyor upon which the bag moves coupled to a series of vacuum cups mounted in pairs above the conveyor. The bag tube is fed to the machine and severed in the desired lengths, then one or both ends are opened by the vacuum cups which attach themselves to opposite sides of the bag tubing and move apart thereby opening the bottom section. A creasing unit folds the spread material in the desired shape to form the bag bottom, adhesive is applied, and the bottom flaps are folded and pressed until the adhesive has set. A valve unit may be incorporated in one end if so desired. This unit may be used to form bags of either single- or multiple-ply construction. 17 figures. W.B.W.

GRANT, FRANK A. Apparatus and method for attaching handles to bags. Canadian patent 493,065. Filed July 4, 1950. Issued May 19, 1953. 19 claims. Assigned to Jay D. Crary.

This is identical with U. S. patent 2,635,510 (April 21, 1953); *cf.* B.I.P.C. 23: 769. 14 figures. W.B.W.

NASMITH, JOHN I. Apparatus for the surface coating of web materials. Canadian patent 492,888. Filed May 5, 1948. Issued May 12, 1953. 2 claims. Assigned to Vickers-Armstrongs Limited.

A roll-coating machine for adhesive surface coating incorporates a slow-running driven feed roller which dips into the coating material in a reservoir, and a light balanced relatively small-diameter stripping roller which is mounted in antifriction bearings that are adjustable in relation to those of the feed roller. This arrangement permits the adjustment of the thickness of the film transferred to the stripping roller. This is the same as U. S. patent 2,574,584 (Nov. 13, 1951); *cf.* B.I.P.C. 22: 296. 4 figures. W.B.W.

SILBY, MARTIN V. Box staying machine. U. S. patent 2,639,649. Filed Dec. 5, 1947. Issued May 26, 1953. 3 claims. [Cl. 93-41]

A means is provided for the accurate alignment of box blanks which have been previously folded. Staying material in the form of an adhesive-coated paper binder is then applied to the corners of the boxes, while these are held rigidly with an anvil supporting the inside corner. 12 figures. W.B.W.

THOMPSON, OSCAR T., and RUTH, HOWARD M. Apparatus for shaping tampon applicator tube ends. U. S. patent 2,639,646. Filed Dec. 2, 1948. Issued May 26, 1953. 3 claims. Assigned to International Cellucotton Products Company. [Cl. 93-36.5]

The machine described receives plain cylindrical tubes of paperboard and performs two operations; one end is smoothed and rounded, the other starred or corrugated to form a tapered end portion. 8 figures. W.B.W.

WILLIAMSON, JAMES T. Method of and apparatus for forming articles such as patty pans from paper or other thin material. Canadian patent 493,114. Filed Aug. 1, 1947. Issued May 26, 1953. 9 claims.

A machine which is adapted for use in the formation of paper patty pans

(e.g., for small cakes) is characterized by a fluted die-and-punch mechanism which is so arranged that the punch will press the paper disks on a platen into a dished die part from which they are ejected by suitable means. This is the same as U. S. patent 2,594,241 (April 22, 1952); *cf.* B.I.P.C. 22: 789. 14 figures. W.B.W.

MACHINERY—CORRUGATING MACHINE

NITCHIE, CHARLES D. Machine for making corrugated paper. U. S. patent 2,638,962. Filed Feb. 24, 1951. Issued May 19, 1953. 9 claims. Assigned to Samuel M. Langston Co. [Cl. 154-31]

The special feature of this single-faced corrugator is an endless belt for holding the corrugated and the facing sheet together until the adhesive has had time to set. An idler roll is provided, so that the belt may be moved to an inoperative position for threading, and pressing is adjustable over an arc of the desired length. The belt is of the same width as the paper being processed. 3 figures. W.B.W.

MACHINERY—CUTTERS

KOBLER, VICTOR, and KOBLER, WERNER. Combination envelope opener and paper sheet cutter. U. S. patent 2,639,771. Filed May 31, 1950. Issued May 26, 1953. 2 claims. [Cl. 164-59]

The provision of a hinged stop makes possible the dual use of this apparatus. With the stop in position, only a narrow edge is cut from the envelope; but with the stop swung out of the way, the instrument becomes a small paper cutter. 6 figures. W.B.W.

PIPER, RONALD N. Apparatus for cutting lengths from a web of paper, cardboard or similar material. U. S. patent 2,640,539. Filed July 12, 1950. Issued June 2, 1953. 5 claims. Assigned to Powers-Samas Accounting Machines Limited. [Cl. 164-68]

Two rotatable knives are mounted in drum-shaped knife holders on either side of the web of paper, cardboard, or similar material. The peripheral speed of the holders is adjusted so that it is equal to or slightly less than the velocity of the web. This is claimed to eliminate pull or hold-back on the web. 10 figures. W.B.W.

STANGE, DELMAR. Cutting shoe for bagmaking machines. U. S. patent 2,640,540. Filed April 13, 1951. Issued June 2, 1953. 5 claims. Assigned to Bemis Bro. Bag Co. [Cl. 164-68]

The cutting shoe claimed requires only the simplest adjustment of the cutting knives. Bag material may be severed or partially severed by the cutting knives for subsequent separation. 6 figures. W.B.W.

MACHINERY—FESTOONING APPARATUS

PAGELL, ALFRED H. Festoon drier. U. S. patent 2,641,469. Filed June 17, 1947. Issued June 9, 1953. 15 claims. [Cl. 271-2.2]

The length of the festoon and the time of travel on the festoon chain are adjustable by simple means on this mechanism. A light source and photocell control the length of the festoon. When the light beam is interrupted, feed on the web is stopped, and a festoon stick carries the web onto the chain.

Lightweight construction made possible by this arrangement does not require the gear changing usually necessary to make such adjustments. 1 figure.
W.B.W.

MACHINERY—GUIDE ROLLS

WESTER, KARL G. Device for guiding weblike material. U. S. patent 2,639,483. Filed Oct. 23, 1950. Issued May 26, 1953. 3 claims. Assigned to A B Svenska Fläktfabriken. [Cl. 26-54]

Two or more spirally threaded rolls or brushes are mounted on guide arms adjustable transversely to the web feed into the drying machine. These rolls are controlled by feeler elements mounted adjacent to each edge of the cloth, paper, or other weblike material. Engagement of the feeler element by the web causes the mounting of the straightening rollers to shift slightly; this movement returns the web to proper alignment. 3 figures. W.B.W.

WINKLER, RICHARD, and DÜNNEBIER, MAX. Device for laterally adjusting webs. U. S. patent 2,640,660. Filed June 2, 1951. Issued June 2, 1953. 12 claims. Assigned to Baltimore Paper Company. [Cl. 242-76]

Feeler elements adjustable to the edge of the web actuate an electromechanical system for shifting one end of the roll shaft to compensate for a shift in web alignment. 5 figures. W.B.W.

MACHINERY—PACKAGING MACHINERY

BURBANK, WENDELL T. Machine for packaging stacked hollow ware such as nested paper cups or the like. U. S. patent 2,641,095. Filed Jan. 13, 1949. Issued June 9, 1953. 13 claims. Assigned to Sutherland Paper Company. [Cl. 53-88]

Paper cups or like items are delivered to this machine in nested arrangement. A heat-sealable material such as cellophane is used for wrapping the stacked cups in a tube-like form which is then sealed along the overlapped edge. A pair of crimpers seal the tube at either end and sever the wrapped articles from the web at the point of sealing. Projecting ends of the wrapping are tucked into the hollow ends of the cups as a final operation. 12 figures. W.B.W.

HURTER, ALFRED T., and ATTENDU, ANDRÉ C. Paper roll wrapping machine. U. S. patent 2,638,725. Filed May 12, 1950. Issued May 19, 1953. 26 claims. Assigned to Stadler, Hurter & Company. [Cl. 53-59] Canadian patent 493,572. Filed May 10, 1950. Issued June 9, 1953. 26 claims. Assigned to Stadler, Hurter & Company. *cf.* B.I.P.C. 23 : 416.

The wrapping of large paper rolls such as newsprint is accomplished by this machine without manual handling. The body wrapper is applied from a roll of wrapping paper mounted on the machine and, as the roll of newsprint is rotated, the edges are automatically crimped and glued. At the end of the wrapping cycle, the wrapped roll is ejected from the machine. 19 figures.
W.B.W.

LOCKE, JEWELL G. Machine for manufacturing and assembling filler partitions. Canadian patent 492,777. Filed Aug. 21, 1947.

Issued May 12, 1953. 22 claims. Assigned to Anchor Hocking Glass Corporation.

A machine is adapted for the manufacture and assembly of corrugated board partitions into filler units for shipping cartons (e.g., for glass articles). This is the same as U. S. patent 2,563,947 (Aug. 14, 1951); *cf.* B.I.P.C. 22: 74. 29 figures. W.B.W.

MURDOCH, JOHN P., and FAULHABER, ALBERT J. Universal packaging machine. U. S. patent 2,639,567. Filed March 13, 1950. Issued May 26, 1953. 45 claims. [Cl. 53-40]

A machine capable of detecting the edges of irregularly shaped articles (meat products) and wrapping these articles with a heat-sealable material such as Pliofilm is controlled by a series of photocell stations. The object to be wrapped is placed on the film, and a second covering is drawn over the article. Heat-sealing heads guided by the photocells detect the edges of the articles and apply the seal a predetermined distance away from the article. A knife is provided as a part of the sealing head to sever the wrapped article from the web. 58 figures. W.B.W.

MACHINERY—PASTING MACHINE

DERR, LOUIS, JR. Paste applicator for wrapping paper. U. S. patent 2,639,689. Filed July 27, 1950. Issued May 26, 1953. 2 claims. [Cl. 118-415]

A tank containing paste or other adhesive rests on the rearward edge of a stack of precut wrapping paper. As the top sheet is removed from the pile, paste from the tank is spread across the rear edge of the sheet. 7 figures. W.B.W.

GENCO, FRANK C., EDMUNDS, ERNEST R., and PANZARELLA, NICHOLAS. Machine for gluing and sealing carton flaps. U. S. patent 2,640,305. Filed Aug. 1, 1949. Issued June 2, 1953. 1 claim. Edmunds and Panzarella's interests assigned to Genco. [Cl. 53-145]

The bottom flaps of the carton are glued and sealed, the product (soap flakes, cereal, or the like) is placed in the carton, and the top flap glued and sealed. Objectionable features of the inclined adhesive applicator rollers are eliminated by tilting the carton during application of adhesive to the top flap. 16 figures. W.B.W.

KINDSETH, HAROLD V. Driers for freshly sealed bag tops. Canadian patent 492,962. Filed May 10, 1948. Issued May 19, 1953. 1 claim. Assigned to Bemis Bro. Bag Company.

Two metal belts, between which a filled cellophane package is carried, are heated sufficiently to reactivate the thermoplastic adhesive used for the top and bottom closure of the bag. Time of contact between the belts is adjusted so that the adhesive has dried and set before the bag is ejected from the apparatus. This device insures a complete seal of both the top and bottom of the bag, thereby preventing sifting out of the contents or entrance of foreign matter. 7 figures. W.B.W.

MACHINERY—PRESSES

COMSTOCK, ALFRED E. Molded pulp carton press. U. S. patent 2,640,401. Filed Sept. 9, 1950. Issued June 2, 1953. 6 claims. Assigned to Shellmar Products Corporation. [Cl. 92-68]

The purpose of this press is to impart a smooth ironed finish to the surface of molded pulp articles such as egg cartons. Cartons as delivered from the forming mold are rough and may suffer misalignment in the stripping operation. The dies of this press serve to realign as well as smooth the rough surface. One or both dies may be heated to obtain better pressing action. 8 figures. W.B.W.

COMSTOCK, ALFRED E. Molded pulp carton press. U. S. patent 2,640,402. Filed April 7, 1951. Issued June 2, 1953. 6 claims. Assigned to Shellmar Products Corporation. [Cl. 92-68]

This is similar to U. S. patent 2,640,401. The method of stripping the carton from the die after pressing differs slightly from the previous patent. 13 figures. W.B.W.

MACHINERY—PULPERS

ELLIS, ENRIGHT A. Paper stock pulper. U. S. patent 2,641,971. Filed Feb. 7, 1949. Issued June 16, 1953. 7 claims. Assigned to Downingtown Manufacturing Company. [Cl. 92-23]

This pulper consists of a tank whose walls are concave lobes forming a clover-leaf shape in cross section. An impeller is mounted in the bottom and rotates in a horizontal plane. Material to be defibered is thrown outwardly from this impeller and then directed back toward the impeller by the lobed shape of the side walls. A portion of the bottom wall may be perforated for the continuous removal of accepted stock, or materials may be charged and removed in a batch operation. 4 figures. W.B.W.

MACHINERY—ROLL STANDS

GUSTAFSON, BERNARD A., and WAHLBECK, JOHN H. Roll holder. U. S. patent 2,639,104. Filed Feb. 9, 1949. Issued May 19, 1953. 7 claims. [Cl. 242-139]

A machine for trimming the marginal edges of roll paper, particularly wallpaper or like material, is claimed. The roll-holder supports are connected by some means (such as a spring), so that these supports tend to position themselves at a minimum spacing. One of the supports is fixed with relation to the trimming knife mounted ahead of the rewind roll. 8 figures. W.B.W.

MACHINERY—SHEET-FEEDING MECHANISM

MATTHEWS, LOUIS L. Feeding and stacking method and machine. Canadian patent 492,845. Filed March 16, 1951. Issued May 12, 1953. 43 claims. Assigned to Maxson Automatic Machinery Co.

Continuous feeding and stacking of sheet material such as paper or board requires the switching from a filled stack to an empty stack or another layboy. Where the sheets are in an overlapped position, switching becomes difficult. The present invention embodies feeder tapes, sections of which run comparatively slowly and others which run comparatively rapidly. By changing the speed of the feeding tapes, a sufficiently long interval for switching the sheet travel from one direction to another is achieved. 9 figures. W.B.W.

MACHINERY—SKID LIFT

ABERLE, ROY. Skid lift. U. S. patent 2,639,150. Filed Dec. 15, 1947. Issued May 19, 1953. 3 claims. Assigned to Southworth Machine Company. [Cl. 271-62]

A phototube and light source are coupled to a motor-driven lifting device, so that paper or other sheet material is always maintained at the most convenient height for the operator. Removal of material from the top of the pile exposes the cell to the light source which activates the lifting mechanism until the light beam is again interrupted. Jogging rails are provided to assure reasonably good register of the material made available to the operator. 6 figures. W.B.W.

MACHINERY—VATS

ENGERT, GEORGE A. Cylinder mold for papermaking machines. U. S. patent 2,641,972. Filed Nov. 21, 1949. Issued June 16, 1953. 1 claim. [Cl. 92-43]

A cylinder mold for high-speed operation is formed from a perforated cylindrical steel plate covered with wire mesh of suitable weave. There are no internal bracing spiders or bars, thereby reducing turbulence in the interior of the mold. A horizontal vane and two vertical vanes separate the interior into a vacuum chamber for removing water from the stock, followed by a pressure chamber to assist in removing the sheet from the wire at the nip of the couch roll. These vanes are gasketted at the cylinder walls. This construction is claimed to make possible speeds in excess of those usually attainable with cylinder machines. 7 figures. W.B.W.

MOLDED PULP ARTICLES

CHEVRIER, EUGENE M. Process of manufacturing blanks from moulded pulp. Canadian patent 492,916. Filed May 30, 1950. Issued May 19, 1953. 3 claims.

A method is claimed for the surface pressing of blanks of molded pulp (preferably containing a certain amount of thermoplastic or thermosetting material) with the application of heat (about 120°C.) to form a cylindrical container. It is especially suitable for forming ribs or beads in the bottom wall of the container. This is the same as U. S. patent 2,611,154 (Sept. 23, 1952); *cf.* B.I.P.C. 23: 148. 7 figures. W.B.W.

PACKAGING

RECHT, SIDNEY. Combination package. U. S. patent 2,639,806. Filed June 20, 1950. Issued May 26, 1953. 2 claims. [Cl. 206-47]

The cover of the carton is formed in such a manner that it holds a dropper bottle (as used for medicinal preparations), and the dropper bulb protrudes through the cover. The bottle may thus be left in the carton for protection without necessitating the removal of the dropper. 4 figures. W.B.W.

PAPER—COATED

BARBER, EDWIN J. Coated paper. U. S. patent 2,640,791. Filed Oct. 26, 1949. Issued June 2, 1953. 4 claims. Assigned to Hercules Powder Company. [Cl. 117-157]

This is similar to U. S. patent 2,640,790 (June 2, 1953) except that a further treatment of the coating is claimed in which glyoxal, acetaldehyde, furfural, or formaldehyde are used to insolubilize the coating binder, thereby increasing the wet-rub resistance. W.B.W.

BARBER, EDWIN J. Coated paper and process for making same.

U. S. patent 2,640,790. Filed Oct. 26, 1949. Issued June 2, 1953. 3 claims. Assigned to Hercules Powder Company. [Cl. 117-157]

A coating material containing a clay and a binder is claimed to flow smoothly and evenly at high speeds, permit printing without picking, and have high wet-rub resistance. Sodium cellulose ethyl ether β-sulfonic acid is used as the binder in one embodiment of the invention, although potassium, ammonium, barium, and calcium salts are also applicable. Total solids of the coating color are preferably between 40 and 55%, and the binder amounts preferably to between 8 and 12% based on the weight of the clay. Titanium dioxide, calcium carbonate, and other well-known coating materials may be used in place of clay. W.B.W.

FAEBER, HARRY W. Method of coating paper. Canadian patent 492,924. Filed Nov. 4, 1947. Issued May 19, 1953. 3 claims.

The coating composition on the transfer rolls of a roll-coating machine is maintained at the dew point of the surrounding atmosphere by the internal cooling of at least one of the rolls with circulating water. The same effect is obtained by the addition of moisture to the atmosphere. This is the same as U. S. patent 2,556,262 (June 12, 1951); *cf.* B.I.P.C. 21: 823. (U. S. patent has one figure.) W.B.W.

THOMPSON, RALPH B. Resins and process for producing same from reaction products of hydroxy aromatic aldehydes and mercaptans. U. S. patent 2,625,534. Filed June 13, 1950. Issued Jan. 13, 1953. 16 claims. Assigned to Universal Oil Products Company. [Cl. 260-48]

A thermoplastic resin suitable for coating paper and textiles is prepared by reacting a hydroxy aromatic aldehyde and a mercaptan in the presence of an acidic catalyst. In one example, one mole of salicylaldehyde is mixed with two moles of ethyl mercaptan and anhydrous hydrogen chloride. The resulting reaction product is washed with water, dried, and distilled under reduced pressure to remove unconverted starting material leaving the clear amber resin. W.B.W.

PAPER—FILLERS

GREEN, BARRETT K. Paper with improved printing characteristics. U. S. patent 2,641,557. Filed Nov. 18, 1948. Issued June 9, 1953. 3 claims. Assigned to The National Cash Register Company. [Cl. 117-152]

A clay material called Attapulgite or Attapulgus clay is composed of a majority of needle-shaped crystals. This clay when used as a paper filler or coating has the capacity to absorb fluids by means of the intercrystalline spaces resulting from the brush-pile structure. This prevents ink bleed on paper so treated. W.B.W.

PAPER SIZING

DOWNEY, WILLIAM F. Higher alkyl ketene dimer emulsion. U. S. patent 2,627,477. Filed Oct. 6, 1949. Issued Feb. 3, 1953. 11 claims. Assigned to Hercules Powder Company. [Cl. 106-170]

Emulsions of higher alkyl ketene dimers suitable for the sizing of paper are prepared by placing the dimer in aqueous solution with an emulsifying

or thickening agent. Paper containing 0.1% of the ketene dimer (based on the weight of the fiber) was highly resistant to penetration by water or ink. W.B.W.

PAPER SPECIALTIES

BARRY, ARTHUR J. Method of rendering water-wettable solid material water repellent and product resulting therefrom. U. S. patent 2,608,495. Filed Jan. 31, 1946. Issued Aug. 26, 1952. 15 claims. Assigned to The Dow Chemical Company. [Cl. 117-143; changed to 117-118] *cf.* B.I.P.C. 23: 270.

The use of organo-silicon esters (rather than organo-silicon halides) for the treatment of normally hydrophilic surfaces to form a water-repellent surface is claimed. These esters do not attack the surface of such materials as wood, cotton, cellulose acetate, etc. as do the halides. A higher organo-silicon ester is prepared by heating a mixture of a sodium salt of an organic carboxylic acid and a solution of an organo-silicon chloride in an equal volume or more of petroleum ether or toluene under reflux at about 100°C.; precipitation of sodium chloride does no longer take place. Heating for 16 hours is usually sufficient. The mixture is filtered to remove sodium chloride, and the solvent distilled off to obtain the organo-silicon product. 3 tables. W.B.W.

BUTTERY, KENNETH T., and SUTHERLAND, LOUIS W., JR. Handled cup. U. S. patent 2,641,403. Filed April 16, 1947. Issued June 9, 1953. 9 claims. Assigned to Sutherland Paper Company. [Cl. 229-52]

The handles on this paper cup are stamped as a part of the body blank. During forming, the portion containing the handles is overlapped and secured with adhesive in such a manner that the handles may be folded away from the cup body and held in this position by an interlocking tongue and slot. Until the handles are erected, the cups may be nested in the usual manner. 7 figures. W.B.W.

CALDWELL, JOHN R. Solutions of proteins and their preparation. U. S. patent 2,625,490. Filed April 20, 1949. Issued Jan. 13, 1953. 5 claims. Assigned to Eastman Kodak Company. [Cl. 106-153]

Salts of an aromatic sulfonic acid, such as benzene sulfonic acid or xylene sulfonic acid, are employed to dissolve protein material (derived from vegetable seeds, such as soybean or cottonseed, or egg albumin, wheat glutin, etc.). The solutions can be used for coating or impregnating paper or textile products. W.B.W.

CAMILLI, GUGLIELMO, and MULLIGAN, LEO. Crepe paper cable insulation. Canadian patent 493,004. Filed Sept. 20, 1950. Issued May 19, 1953. 6 claims. Assigned to General Electric Company.

An electrical cable includes an electrical conductor and a plurality of layers of crepe-paper tape spirally wound about the conductor. The crepe-paper tape has two crepings substantially perpendicular to each other so that each individual layer of the tape can stretch in two directions. The cable is capable of withstanding sharp bends. This is the same as U. S. patent 2,607,823 (Aug. 19, 1952); *cf.* B.I.P.C. 23: 71. 7 figures. W.B.W.

CAMILLI, GUGLIELMO, and MULLIGAN, LEO. Two-way stretch paper in insulated cables. Canadian patent 493,188. Filed Dec. 4,

1951. Issued May 26, 1953. 4 claims. Assigned to General Electric Company.

This is identical with U. S. patent 2,607,824 (Aug. 19, 1952); *cf.* B.I.P.C. 23: 71. 7 figures. W.B.W.

CHARTRAND, VICTOR E., and JAMES, PAUL E. Decalcomania. U. S. patent 2,641,562. Filed Nov. 2, 1950. Issued June 9, 1953. 2 claims. [Cl. 154-46.8]

A decalcomania with a paper backing embodies a permanently tacky water-insoluble coating on the face which is covered with a water-soluble coating. This water-soluble coating is a protection for the tacky coating and makes possible the piling of the decalcomanias. 2 figures. W.B.W.

HARMAN, DENHAM, and SOMMER, HARRY J. Acylated complex oxygen-containing polyamines. U. S. patent 2,640,822. Filed Aug. 22, 1949. Issued June 2, 1953. 8 claims. Assigned to Shell Development Company. [Cl. 260-97.5]

These compounds are formed in a reaction involving anhydrous ammonia and acrolein in the presence of hydrogen under high pressure with a catalyst and methanol as a solvent. The complex oxygen-containing polyamine prepared above was mixed with oleic acid in the ratio of 3:1 by heating to 240°C. with stirring. Tall oil may also be added to the oxygen-containing polyamine materials to improve the adhesive properties of asphalt. Among the uses claimed for the paper industry are those of a beater additive along with known sizing agents and the application in emulsion form as a coating for paper, cloth, felt, and the like. 3 tables. W.B.W.

HUNTER, MELVIN J., and SERVAIS, PHILIP C. Preparation of alkoxy hydrosilanes. U. S. patent 2,626,273. Filed Nov. 5, 1947. Issued Jan. 20, 1953. 7 claims. Assigned to The Dow Chemical Company. [Cl. 260-448.8]

These compounds, suitable as water repellents, are prepared by treating chlorohydrosilanes with alkoxysilanes. No hydrochloric acid is liberated during hydrolysis and condensation of the silanes, thereby making them useful for treatment of paper, fabric, and ceramics. W.B.W.

NEWMAN, DOUGLAS A. Planographic printing plate. Canadian patent 492,980. Filed Jan. 4, 1946. Issued May 19, 1953. 31 claims. Assigned to Columbia Ribbon & Carbon Manufacturing Company, Inc.

A paper printing plate provided with a coating of carboxymethylcellulose or a salt or derivative of a carboxymethyl ether is claimed to maintain the desired balance between its hydrophilic and oleophilic properties. It will retain sufficient water to prevent the formation of background specks and maintain a true image applied to it after the coating. Inert fillers (such as China clay) incorporated in the coating will hold the image better, whereas plasticizers (such as glycerine) make the plate pliant; alcohol will accelerate drying and solidification of the protective film. W.B.W.

STERN, WALTER. Garment bag. U. S. patent 2,639,028. Filed Nov. 3, 1949. Issued May 19, 1953. 5 claims. Assigned to The Cromwell Paper Company. [Cl. 206-7]

A bag of the type used by cleaning establishments has overlapping flaps at the top opening. This allows a tighter seal around the hanger, whether wire or a cardboard shank is used. The top and bottom flaps are coated with a dry or pressure-sensitive adhesive, or may be closed by stapling, heat sealing, or any other manner. The bag is dust- and mothproof. 8 figures.
W.B.W.

THOMPSON, PAUL. Pan liner. U. S. patent 2,639,212. Filed June 7, 1950. Issued May 19, 1953. 1 claim. Assigned to Bestpak Inc. [Cl. 8-120]

A web formed from kraft, sulfite, news, parchment-type, or alpha pulp is treated with acetic or benzoic anhydride (about 3%) in glacial acetic acid and allowed to react at a temperature not over 40°C. Stearyl or benzoyl chloride may likewise be utilized. A desirable surface may be achieved by dissolving stearate chromic chloride in alcohol and water, to which is added a small amount of sodium formate and urea. The above solution may be applied as a dipping process or sprayed on the sheet. Improved grease resistance may be imparted to the sheet by a treatment of 2 to 5% of a water solution of polyvinyl alcohol. Cellulose sheets treated in this manner will not adhere to the product, regardless of sugar content, or to the pan. W.B.W.

URBAN, STEPHEN F., and BLUMENTHAL, WARREN B. Water repellence fixative treatment. U. S. patent 2,641,558. Filed Dec. 24, 1948. Issued June 9, 1953. 7 claims. Assigned to National Lead Company. [Cl. 117-154]

The fixation of water-repellant compounds in a fabric or cellulose sheet material is accomplished by first soaking the material in the treating compound. Excess solution is removed, and the web is then passed through a fixative bath containing basic zirconyl chloride, stannous chloride, or ferrous sulfate. Paper so treated is still porous and suitable for sensitized photographic and print paper.
W.B.W.

PENETRATION

ROSS, JAMES H., HART, JOHN S., STRAPP, RICHARD K., and MAASS, OTTO. Production of cellulose pulp. U. S. patent 2,640,774. Filed July 16, 1949. Issued June 2, 1953. 8 claims. Assigned to Pulp and Paper Research Institute of Canada. [Cl. 92-6]

A pretreatment with steam of the wood chips or other cellulose material used for the production of pulp (sulfite, kraft, or other) is claimed to facilitate uniform penetration of the cooking liquor, thereby resulting in a more uniform pulp (Va-Purge process). Pressures in the range of 20 to 50 p.s.i. have been found adequate with no advantages shown for pressures above 50 p.s.i. The rapid introduction of steam into the digester and the immediate release of pressure after the maximum has been attained are important. A period of no more than five to six minutes should be required for the reduction of pressure to atmospheric or near atmospheric. This rapid release of pressure causes the water in the chips to flash into steam, purging air and excess water (if present) out of the chip. If the chips are below the optimum "fiber saturation point," this treatment provides for the introduction of the necessary water. More than one pretreatment may be found desirable. A two-stage cooking cycle may also be found advantageous, in which the cooking liquor is pumped into the digester, brought under pressure to impregnate the chip, and then withdrawn before the cooking cycle has been completed. 2 figures.
W.B.W.

PLASTICS—PAPER-BASE

GRANGAARD, DONALD H. Process of continuously uniting resin impregnated cellulosic webs for decorative coverings. U. S. patent 2,640,799. Filed May 19, 1948. Issued June 2, 1953. 11 claims. Assigned to Paper Patents Company. [Cl. 154-138]

Contact pressure resins of the unsaturated polyester type are utilized in this laminating process. The cellulose web is dried by suitable means to a low moisture content, preferably 1 to 1.5%, then impregnated in a bath of the fluid resin. Sheets are brought together on the laminating roll at a low angle and subjected to a low nip pressure and a carefully controlled heat on the curing roll. These laminated sheets are suitable for decorative table tops or wall coverings. 7 figures. W.B.W.

PYRITES

LEWIS, WARREN K. Roasting sulfide ores. U. S. patent 2,637,629. Filed June 2, 1947. Issued May 5, 1953. 8 claims. Assigned to Standard Oil Development Company. [Cl. 23-177]

The object of this invention is the provision of a method for producing from sulfide ores, particularly pyrites, sulfur dioxide substantially free from sulfur trioxide, free oxygen, and elemental sulfur, and to leave the metal sulfide substantially free of sulfur. Sulfide ore in a finely divided state is suspended in an oxidizing atmosphere of controlled temperature so that sulfur is liberated with the formation of a minimum amount of metal oxide. The liberated sulfur is removed from the fluidizing zone and then burned under controlled conditions to produce sulfur dioxide with a minimum amount of sulfur trioxide. The metallic ore, in a fluidized state, is then converted to the oxide by treatment with hot oxidizing gas. 1 figure. W.B.W.

ROOFING FELTS

PARSONS, JOSEPH R., HIGGS, MORTON C., and LOOS, MARY A. Coating composition and fire resistant building element coated therewith. U. S. patent 2,640,786. Filed July 8, 1948. Issued June 2, 1953. 10 claims. Assigned to United States Gypsum Company. [Cl. 106-282]

A fire-retardant coating for composition shingles is formed by the use of preformed mineral-wool pellets and asphalt. This is spread over the impregnated felt formed from paper, rags, etc.; mineral granules, gravel, or any other protective covering are imbedded in the surface. W.B.W.

ROSIN

ROBINSON, JOHN C., JR., and ROPP, WALTER S. Vinyl esters of chemically stabilized rosins and polymers thereof. U. S. patent 2,614,997. Filed Sept. 16, 1950. Issued Oct. 21, 1952. 13 claims. Assigned to Hercules Powder Company. [Cl. 260-27]

The vinyl esters of chemically stabilized rosin acids can generally be polymerized in substantial yield using comparatively weak peroxide polymerization catalysts. Polymers so prepared have higher molecular weights than those prepared from vinyl esters of rosin under identical conditions, therefore possess greater hardness, higher softening point, etc. They are useful in the manufacture of protective coatings, as resinous ingredients in heat-set inks, and as modifiers for paraffin wax in the paper-converting field. W.B.W.

SETUP BOXES

THURSTON, BENJAMIN L. Box. U. S. patent 2,639,854. Filed Nov. 20, 1951. Issued May 26, 1953. 1 claim. Assigned to Frost Box Co., Inc. [Cl. 229-14]

A liner strip for insertion into the lid of telescoping boxes for adjusting the amount of overlap is claimed. The width of the strip governs the amount that the top may overlap the bottom section. 5 figures. W.B.W.

SHIPPING CONTAINERS

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,640,643. Filed July 9, 1948. Issued June 2, 1953. 11 claims. [Cl. 229-34]

Double walls in this container hold small articles in place so that they can be viewed from several sides without removal. This serves the two-fold purpose of affording protection to the articles during shipment and providing an attractive display carton. The carton may be partially assembled and still shipped to the user in the flat form. 28 figures. W.B.W.

SHIPPING CONTAINERS—FIBER DRUMS

BARNES, THOMAS F. Cylindrical container and method of making same. U. S. patent 2,638,820. Filed July 1, 1947. Issued May 19, 1953. 2 claims. [Cl. 93-39.1]

Fiberboard drums are formed by a number of plies of a flexible paperboard or similar material. The blank is initially precut along a staggered line, so that when formed into a tubular body, one end forms a cover member which telescopes over the body of the container. Top and bottom portions of the container are of metal or other suitable material and are crimped to the ends of the tubular body. A tear string is provided for opening the container. 9 figures. W.B.W.

SULFITE PROCESS

KYRKLUND, GUNNAR. Method in sulfite pulping for obtaining concentrated waste liquor. U. S. patent 2,639,986. Filed Sept. 3, 1947. Issued May 26, 1953. 3 claims. Assigned to Kymin Osakeyhtiö-Kymmene Aktiebolag. [Cl. 92-11]

A two-stage sulfite pulping procedure is outlined, in which the spent liquor withdrawn from one cook is fortified with a suitable base and sulfur dioxide and used for the precook stage in the next cook. Upon withdrawal from the digester, the spent liquor contains approximately twice the amount of organic solids found in the spent liquor from a one-stage cook. By a careful utilization of the wash water in the acid make-up, it is claimed that the final wash water to the sewer will contain only minute amounts of organic material, thereby resulting in more complete recovery of organic substances and reduction in stream pollution. W.B.W.

SULFITE WASTE LIQUOR

EHRENSPERGER, HANS. Process for the recovery of valuable constituents from waste sulphite liquor. Canadian patent 492,870. Filed Sept. 3, 1949. Issued May 12, 1953. 4 claims. Assigned to St. Lawrence Corporation Limited.

Addition products of a ligneous nature, which are useful as plastics, are

formed and precipitated by the subjection of spent sulfite liquor to the action of reagents selected from the group consisting of quaternary ammonium bases and salts. This is the same as U. S. patent 2,594,302 (April 29, 1952); *cf.* B.I.P.C. 22: 798-9. W.B.W.

SULFUR

LEUTZ, KOERNER E. Recovery of sulfur from gases. U. S. patent 2,641,527. Filed April 12, 1949. Issued June 9, 1953. 6 claims. Assigned to Sun Oil Company. [Cl. 23-2]

An aqueous solution of an iron salt with a weakly acidic anion such as ferrous acetate, ferric formate, ferrous lactate, and ferrous tartrate may be used to remove hydrogen sulfide from a gaseous mixture. The gases and salt solution are circulated counter-currently in a packed tower. Recovery of the sulfur involves an oxidation process during which free sulfur is precipitated. This sulfur is removed by filtration or other mechanical means. Readjustment of the pH to the range of 4 to 7 makes the salt solution suitable for re-use. 1 figure. W.B.W.

TALL OIL

GLOYER, STEWART W., and VOGEL, HENRY A. Treatment of tall oil. U. S. patent 2,640,823. Filed June 4, 1946. Issued June 2, 1953. 17 claims. Assigned to Pittsburgh Plate Glass Company. [Cl. 260-97.6]

A method for the purification of tall oil fractions is outlined with the objective of obtaining esters of tall oil and rosin acids substantially free of fatty acids. The method involves the esterification with an alcohol, dissolution of the major portion of the rosin acids with furfural, removal of solvents by distillation or other means to obtain a concentration of fatty acids and unsaponifiable matter, recovery of relatively pure fatty acid esters by distillation, treatment of the unsaponifiable matter with alkali, and recovery of the unsaponifiable matter with a solvent. 1 figure. W.B.W.

SCHMUTZLER, ALFRED F. Tall oil-polyamino-aldehyde reaction product. U. S. patent 2,640,814. Filed June 12, 1951. Issued June 2, 1953. 19 claims. Assigned to American Cyanamid Company. [Cl. 260-21]

Printing inks and architectural finishes are prepared from a product in which tall oil, dicyandiamide, and naphtha are reacted and then treated with an aqueous formaldehyde solution; the water is distilled off, leaving the resin. The material dries to a hard, tack-free surface overnight. W.B.W.

TANNING

STODDARD, WILLIAM B., JR. Alkali-lignin tanning agents and method of preparation. U. S. patent 2,640,052. Filed July 25, 1950. Issued May 26, 1953. 8 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 260-124]

Spent liquor from the soda, kraft, or alkaline sulfite processes, either in the dilute or concentrated form (preferably the latter), is acidified (maximum yield at pH 4) to precipitate the alkali lignin in a form known as "sodium lignate." The sodium lignate is separated from the liquor, redispersed in water, then chlorinated until the lignin product analyzes 15 to 30% chemically combined chlorine on the weight of the dry product. Undesirable salts may be

removed by washing at a low pH at this point. This product is solubilized by raising the pH to 8 or 8.5 with the addition of an alkali-metal hydroxide, carbonate, or bicarbonate. The final pH is adjusted as desired for the tanning operation. These tanning agents may be used alone or in combination with commercial vegetable tanning agents (e.g., quebracho, wattle, sulfite spruce) to produce leathers, light brown in color, resistant to tearing, cracking, shrinking, and mold growth. W.B.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

SEYB, LESLIE P., and NEROS, CLIFFORD A. Flameproofing method and product. U. S. patent 2,640,000. Filed June 7, 1947. Issued May 26, 1953. 8 claims. Assigned to Diamond Alkali Company. [Cl. 117-76]

A flame-retarding and water-repelling substance, such as antimony oxide, and a chlorinated paraffin are adapted to co-act in a flame-retarding relationship when exposed to flame temperatures upon a fibrous or fabric base. The inorganic flame-retarding material is applied first in solution so that the fibers are completely coated. The chlorinated organic material is then applied in a solvent which is nonsolvent for the film material already deposited on the fiber. In this fashion, the release of chlorine at service temperatures will not have a deleterious effect upon the fibers. W.B.W.

VACUUM COATING

GODLEY, PHILIP, 2ND. Deposition of metal on a nonmetallic support. U. S. patent 2,622,041. Filed Aug. 3, 1948. Issued Dec. 16, 1952. 2 claims. Assigned to National Research Corporation. [Cl. 117-60]

A method for the deposition of metal by vacuum evaporation on a nonmetallic support such as paper, cellophane, or fabric is claimed to overcome serious operational difficulties. The evolution of water vapor and hydrogen by the web has, in the past, tended to reduce the vacuum below that required for efficient evaporation. As disclosed in this patent, a heat treatment at a temperature below that which permanently weakens the web has been found to obviate the difficulty. 1 figure. W.B.W.

WASTE LIQUOR

ARIES, ROBERT S., and POLLAK, ARTHUR. Method of oxidizing sodium sulfide to sodium sulfite in successive stages. U. S. patent 2,640,758. Filed Feb. 23, 1949. Issued June 2, 1953. 6 claims. [Cl. 23-129] *cf.* B.I.P.C. 23: 360.

An improved process (Sulfox process) is claimed for the conversion of sodium sulfide and the recovery of sodium sulfite from waste liquors of the sulfate and neutral sulfite processes. The sodium sulfide solution is mixed with sodium carbonate to preserve a thin film so that the sulfide may oxidize. The heat of reaction is sufficient to evaporate all of the water in the solution, thereby stopping the reaction. Water must be added as required to continue the reaction until all sodium sulfide is oxidized to sulfite. Temperatures employed are preferably in the range of 275 to 295°F. Air is supplied to the reaction in 100% excess and introduced at numerous points at low velocity. This precaution minimizes dusting and insures fresh air at successive stages of the process. 1 figure. W.B.W.

WET STRENGTH

JACKSON, ELWOOD F. Modified melamine-formaldehyde resins. U. S. patent 2,608,546. Filed Jan. 26, 1949. Issued Aug. 26, 1952. 7 claims. Assigned to Monsanto Chemical Company. [Cl. 260-45.1]

The modified water-soluble melamine-formaldehyde resin (I) is prepared as in the following example: A mixture of one mole of melamine, eight moles of formalin, and one mole of sodium salicylate is heated on a water bath until a clear solution forms. This is adjusted to a pH of 7 to 8 with aqueous alkali and heated under reflux for five hours. An aqueous fiber suspension treated with a solution of (I) containing 5% solids by weight showed a resin pickup of about 3% based on the weight of the paper. Paper formed from this treated fiber, after curing, showed improved wet strength. W.B.W.

JAMES, RAYMOND W., and PINGS, WILBUR B. Water soluble cationic resins. U. S. patent 2,626,251. Filed Aug. 25, 1948. Issued Jan. 20, 1953. 7 claims. Assigned to Imperial Paper and Color Corporation. [Cl. 260-70]

The use of these water-soluble, thermosetting resins results in a high wet-strength paper. They are particularly suited to addition at the wet end of the paper machine. In an example, 75 grams of urea, 66 grams of triethanolamine, and 40 grams of isopropyl alcohol are heated to 80°C. under reflux with stirring. 213 grams of 37% formalin are added and refluxing continued for 15 minutes. After cooling to 25°, 6 *N* hydrochloric acid is added to reduce the pH to 1.5, then 30% sodium carbonate to bring the pH to 6. W.B.W.

KELLER, KARL, and HANSEN, OTTO. Condensation products from an aminotriazine and trimethylolacetaldehyde. U. S. patent 2,603,624. Filed Dec. 27, 1950. Issued July 15, 1952. 3 claims. Assigned to Cassella Farbwerke Mainkur. [Cl. 260-67.6]

Condensation products whose aldehyde component is an aliphatic aldehyde containing methylol groups exhibit high water solubility of the primary condensation product and a relatively high elasticity of the final condensation product in comparison with formaldehyde condensation products of the same degree of condensation. In an example, 63 parts of melamine are mixed with 140 parts of water and 401 parts of a concentrated solution (83.5%) of trimethylolacetaldehyde. This solution is heated to 70°C. as fast as possible, then made alkaline by adding caustic soda and sodium carbonate. The temperature is raised to 80° for 30 minutes, then immediately cooled. The resulting solution is viscous at room temperature and contains about 65% of the condensation product thus formed. Paper treated with the above compound exhibits improved wet strength. W.B.W.

MACKINNEY, HERBERT W., and SCHULTZ, SIDNEY J. Manufacture of wet strength paper. U. S. patent 2,642,360. Filed Dec. 27, 1946. Issued June 16, 1953. 5 claims. Assigned to Union Carbide and Carbon Corporation. [Cl. 92-21]

A urea-formaldehyde resin which is soluble in an alkaline aqueous medium is produced by treating the resin with resorcinol dissolved in ethyl alcohol and heating, then adjusting the pH to 8 with triethanolamine. Paper made from southern kraft fiber treated with the above solution showed a wet tensile strength of 5.9 lbs./inch after drying one minute and 7.3 lbs./inch after curing at 360°F. for three minutes. The same stock without the resin showed a wet strength of 0.4 lbs./inch. W.B.W.

SUEN, TZENG-JIUEQ. Acid-resistant wet strength paper. U. S. patent 2,639,242. Filed Aug. 14, 1950. Issued May 19, 1953. 1 claim. Assigned to American Cyanamid Company. [Cl. 117-155]

The following example of resin preparation is given: 94 parts of phenol, 121.7 parts of formaldehyde (37% solution), 17.8 parts of beta-alanine, 48.8 parts of sodium hydroxide (5 *N* aqueous solution), and 77 parts of water. The above are mixed and heated at reflux for 35 minutes, cooled to 25°C., and then diluted with water to a 10% solution. Resin solids in the amount of 3% are added together with 3% alum as a beater additive to unbleached kraft pulp. Rag, soda, groundwood, Asplund fiber, sulfite, and the like may also be utilized. An improvement in wet strength is claimed for the treated sheet, with no substantial loss in strength after soaking under acid conditions for a week or more. This is similar to Canadian patent 473,753 (May 22, 1951); *cf.* B.I.P.C. 21: 830. W.B.W.

WOHNSIEDLER, HENRY P., and THOMAS, WALTER M. Colloidal melamine-urea-formaldehyde copolymer solutions. Canadian patent 492,766. Filed Jan. 4, 1945. Issued May 12, 1953. 12 claims. Assigned to American Cyanamid Company.

A formaldehyde condensation product containing 70 mole-% of urea and 30 mole-% of melamine forms a colloidal cationic solution which can be added to kraft or sulfite pulp in the beater; the resulting paper has good wet-strength properties. This is the same as U. S. patent 2,485,079 (Oct. 18, 1949); *cf.* B.I.P.C. 20: 464. (U. S. patent has 4 figures.) W.B.W.

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